The University of Alberta

# VOCATIONAL EDUCATION IN JAPAN
# A SURVEY FROM 1868 TO 1980

By

© DONALD F. CASSEL

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled "VOCATIONAL EDUCATION IN JAPAN" submitted by Donald F. Cassel in partial fulfillment of the requirements for the degree of Master of Education in Vocational Education.

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## ABSTRACT

PURPOSE OF THE STUDY

At the present time a very limited amount of written information is available that is specifically directed towards the development of the vocational education system in Japan. the evolution of Japan from an obscure, feudal society less than 125 years ago, later materially destroyed in 1945 to the vibrant, democratic, technological powerhouse she is today, would seem to warrant a closer study.

The thesis was undertaken to examine and identify the influences which led to the establishment of the vocational education system existing in Japan today.

The time frame from 1868 to 1980 (112 years) was chosen as the period during which the foundation for vocational education in Japan was laid, as well as the period during which the most profound societal and educational changes took place.

The study included historical, sociological and economic aspects of Japan's development with emphasis on the educational developments which flowed from these influences. An explanation of the Sempai-Kohai sociological phenomena was included because of the part this hierarchial structure plays in schools, in industry and how this structure affects the progress of students into upper schools and industry.

The distinctly Japanese "dual structure" of the economy was examined and explained with notes on how the dual structure affects the corresponding "dual structure" of vocational education and the subsequent employment situation faced by young workers after graduation from a vocational education.

As part of the "dual structure" both the public vocational education programs and the private vocational programs were examined. The Yawata Steel Company program was used as an example for other large companies in Japan, since the publication of an excellent work by Levine and Kawada had explained the history of Yawata's program in detail.

The "dual structure" also influenced the type of education recieved by vocational students, since the public vocational education system developed a generalist approach to vocational education, while the private vocational schools developed a specialist approach directly related to the commercial and or industrial activities of the company offering the training program, although within a generalist framework.

Dr. H. Ziel's book MAN, SCIENCE AND TECHNOLOGY was used as a reference and comparitive work since it proposes creation of a generalist approach to vocational education that is somewhat similar to the Japanese public vocational

system, but in a North American context, ready made for application to North American school systems.

The conclusion that a generalist approach to vocational education is superior is a result of the appreciation of the current difficulties faced by many tradesmen who are currently unemployed or underemployed and who face considerable difficulties finding employment in other fields. Many of these difficulties may be traced directly to a lack of flexibility in the vocational education system, excessive rigidity in the trades structure and a general attitude in which the employer hires a skill rather than an individual, leading to the notion that "if the skill becomes obsolete, dispose of the individual offering that skill through layoffs or firing, rather than considering the individual as a valuable worker" and retaining him.

In Japan the opposite is true, especially in the large companies, which exert a stabilizing influence on the labor market, hence promoting social harmony. There is much to learn and to explore in this field alone. The part that Arinari Mori played in the establishment of the Japanese vocational education system is explored, with emphasis on the rather considerable accomplishments of this man. Information is also included on the part that General Douglas MacArthur played in the overhaul of the Japanese school system after the occupation of Japan by

American forces in 1945. Finally, the later reforms and adjustments, in Japan's postwar vocational education system designed to take account of new economic factors are noted and recorded.

## RESULTS OF STUDY

The study brought to light a good deal of information that is not generally available in North American regarding the establishment, growth and accomplishments of the Japanese vocational education system. It also highlighted the contributions made by the Japanese vocational education system to Japan's development to a powerful, efficient economic force in the world today.

The Recommendations offered were the result of numerous discussions with knowledgable persons in the educational field, Japanese education and culture and as a result of careful evaluation of the printed material available. Amongst these were the following:

1. For Japan, the deletion of the Kanji alphabet from the required subjects in school and transferral of this alphabet to optional studies or classics studies.

2. For Alberta, to undertake intensive study of Japanese industrial strategy and the relationship of vocational education to this strategy. Zero in particularly on course outlines and study guides.

3. Try out the Ziel program in its entirely in an updated version (ie computers).

4. Restructure regular and vocational courses to produce the flexible and productive graduate well able to take advantage of new opportunities in the future.

5. Involvement of industry in vocational planning and programs.

6. Expansion of verification proceedures for skills such as the "Red Seal" program, or a varient of the State Board Examinations used by the Nursing profession to gain continent-wide recognition of skills attained as well as a consistent standard, continent-wide which will verify those skills. The object is to attain the maximum flexibility and mobility of the graduated individual student.

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Donald F. Lassel

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# CHAPTER I

# INTRODUCTION

## PURPOSE OF THE STUDY

The evolution of Japan from a feudal society, materially destroyed in 1945, to the vibrant, democratic, technological powerhouse she is today, is one of the great success stories of modern history. At least part of this success can be attributed to Japan's education system. Japan's industrial strength is founded on her skilled workforce, which is in turn based on her vocational schools. Japan's system of vocational education would therefore seem to be worthy of further study.

Unfortunately there is only a very limited amount of information available on the development of the vocational education system in Japan. This thesis will therefore explore the history of the development of Japanese vocational education and provide a detailed study of the current vocational system.

The supporting objectives of this study are:

(1) To examine and identify the influences which led to the establishment of the vocational education system in Japan.

(2) To examine what role education has played in the nation's industrialization process.

(3) To examine the changes in the education system with particular emphasis on the role of vocational education.

## SIGNIFICANCE OF THE STUDY

The significance of the study is that a well documented historical report on the development of vocational education in Japan has not been readily available. This thesis will utilize extensive interview data, along with material previously published in Japan and elsewhere, to produce such a document.

Students wishing to explore the educational systems of other countries to gain a better understanding of these countries' vocational training programs should have ready access to information on the Japanese system. It is hoped that this report will be a useful addition to the library.

Furthermore, the Japanese success in creating a modern industrial democracy suggests that other nations may find much to admire in her vocational education system. While not suggesting that we slavishly copy the Japanese, some valuable lessons may be learned and applied to Alberta's educational system. As an example, in the Japanese system, students are required to take a second language (usually English), whereas in Alberta's vocational schools, there is no such second language requirement. The implication here is that Japanese

workers are able to utilize technical information printed in other languages first hand, rather than relying on eventual translation by others. This in turn allows Japanese industry to respond rapidly to any technological advance made by its overseas competition. It is through such analysis of the unique strenghs of the Japanese vocational education system that we may discover and correct any weaknesses in our own.

## DELIMITATIONS

This study was primarily concerned with Japanese education between 1868 and 1980.

While this period was considered the most important for the study, it was felt that to understand the rapid growth of modern education in Japan, an introduction to the islands and to the people was of great importance. Therefore, an historical description of the economic evolution of Japan and its effect on the vocational education system has been included.

To provide continuity and depth to the study it was necessary to include a report on the regular education system.

Because Japan possesses a long and varied history as well as a rich cultural background for its national identity, those aspects of this history which affected the growth of the vocational education system have also been included.

Since the various central governments of Japan from 1878 to 1980 have uniformly regarded vocational education as a means towards advancing the national industrial goals of Japan, the numerous acts and laws which affected both the economy and vocational education were included.

## DATA COLLECTION TECHNIQUE

Research for this thesis proceded along two lines: an extensive review of published material currently available in the English language; and personal interviews with those persons considered to be knowledgeable about the Japanese vocational education system.

In addition to those publications that were available locally through the University and public library systems, the researcher obtained materials, such as current periodicals, from the Consulate of Japan,Edmonton; the Japan Trade Organization, Edmonton; Professor Hiroshi Tanaka, University of Lethbridge;and the Department of East Asian Studies, University of Alberta. Further information was sought by writing letters to those agencies directly involved in vocational education in Japan. A list of suitable agencies was obtained from the Consulate of Japan, Edmonton. Included in these were, The Minister of Education, Japan; Minister of Vocational Education, Japan; and the Technical Trade Schools located in Kanazawa, Tokyo, Osaka, and Oita. The response to most of these letters, however, was rather disappointing. The

only organizations that replied were the Ministry of Education, Tokyo, and the Technical College at Oita, Kyushu, Japan.

Of the sources contacted, the Consulate of Japan, Edmonton, proved to be quite rewarding. A number of highly useful, informative, English-language publications directly related to the study were made available to the researcher. Further English-language publications were provided by the Ministry of Education, Japan, the Department of East Asian Studies, and the Ruthford Library of the University of Alberta, Edmonton. Contact with Dr. Hiroshi Tanaka, University of Letbridge, also proved most helpful, as a number of published texts were obtained, as well as some most helpful verbal explantions.

In order to clarify a number of points for this study, the researcher undertook extensive travel and interviews with individuals possessing considerable knowledge about the Japanese educational system. Information was collected through personal interviews with members of the work- force in Japan, faculty members of Japanese schools and Universities, and faculty members of the University of Sacramento, California.

Communications were also undertaken with persons recommended through personal contacts. These personal communications proved to be much more fruitful as many informative, frank and interesting discussions were

achieved, leading to a clearer understanding of the Japanese experience.

Interviews undertaken included the following persons:

(1) Mr. K. Doi, retired employee, Minister of Education, Oita Prefecture, Japan

(2) Mr. Kiyoshi Doi, Toyota Motor Co., Nagoya, Japan

(3) Management and Staff, Toyo Kongyo Co. (Mazda) Plant, Hiroshima, Japan

(4) Dr. Kazuo Ninomiya, University of Sacramento, California

(5) Dr. Kaoru Ohta, Dept. of East Asian Studies, University of Alberta, Edmonton

(6) Dr. Hiroshi Tanaka, University of Lethbrige, Alta.

(7) Dr. Toshizuki Tani, Momoyama (St. Andrews) Univerity, Osaka, Japan

(8) Mr. I. Ueno, Package and Container Manufacturer, Himeji and Tokoyo, Japan

(9) Mr. K. Yamane, Japan National Railroads, Osaka

(10) Dr. K. Yokoyama, Ehime University, Matsuyama, Shikoku, Japan

The researcher contacted the above universities and colleges in addition to the above individuals during visits to Japan in 1976.

Further confirmation and expansion of information from these early interviews was obtained by telephone and

by letters in 1980 and 1981. The researcher perceived these interviews as being an invaluable step in collecting and evaluating data for the study, since they tended to confirm other data gathered on the study. For the list of interview questions see Appendix One.

## ASSUMPTIONS

The following assumptions apply to the study:

(1) The publications that were obtained from the Consulate of Japan, Edmonton, contained information which accurately recorded events and ideas that occurred in Japan. Given Japan's democratic government and freedom of information, there is little reason to suspect that these publications would deliberately misrepresent events.

(2) These documents contained information that was noteworthy at the time the sources were published. Considering the difficulties and expense inherent in translation, it may be assumed that only the most significant information is selected for translation and publication in English.

(3) Translations from the Japanese are accurate. While mistranslations are an unavoidable hazard in cross-cultural research, it may be assumed that substantial errors have been minimized in this thesis through extensive cross-checking between the various materials and interviewees.

## LIMITATIONS

Because the research was solely funded by the researcher, travel and interviews were subject to time and financial limitations. These may also be considered as limiting the scope of the study.

A further limitation is the fact that the study required extensive cultural and historical research in order to enhance the researcher's insight into the sociological environment of Japan. Lack of familiar reference points must certainly be considered a limitation of the study.

As with any interview-supported research, there is a possibility that certain events may have been forgotten, overlooked, or blurred in the minds of the researcher and the interviewees. Therefore, this could further add to the limitations of this study.

## ANALYTICAL FRAMEWORK

The researcher felt that a necessary adjunct to the study of the Japanese vocational education system was a thorough appreciation of Japanese history, culture, and the character of her people.

The researcher further felt that these three factors have had a profound effect on the construction of the vocational education system currently in place in Japan. (A further necessary component of this research is a basic appreciation of the Japanese culture when interacting with

the interviewees.)

These influences will hopfully present a cross-section of the development of vocational training in Japan and give the reader an insight into Japan's vocational education environment.

MAN, SCIENCE AND TECHNOLOGY by H.R. Ziel is used as a comperative reference since it is written in a North American context using ideals and values common to this continent for its philosophical direction.

The researcher felt that the use of H.R. Ziel's work was more useful than those publications which tend to reflect semi-obsolete technological ideals since the reader's attention would be more usefully directed towards the future in North America rather than reviewing past structural periods.

## DEFINITION OF TERMS

| | |
|---|---|
| SEMPAI | The senior member and/or power dispenser of a group in Japan. The focus of the power of a group or a localized leader of a group. |
| KOHAI | The junior member and/or receiver of power or support. The supporter of a Sempai or follower of a group leader. |
| OYABUN | A skilled craftsman in pre-Meiji Japan. A teacher or foreman for a group of workers. In many ways, similar to a Journeyman worker in the West. Same word also used to describe a paternal parent. |
| KOBUN | An apprentice worker who functions under the guidance of an Oyabun. Similar to an apprentice to a tradesman in Western society. Same word also used to describe a child in a family. |
| SENMON GAKKO | A technical college modelled on the French and/or Russian Polytechnics. Generally responsible for educating and training lower level engineers, technicians or foremen. Usually a five year program starting a grade ten or age 15. |
| TERAKOYA | A locally established school - usually one room, with one instructor directed towards the education of lower class people or commoners under the Tokugawa Shogunate. |
| HAN | A local, upper class school whose purpose was to educate samurai and/or other members of the upper class under the Tokugawa Shogunate. |
| ZAIBATSU | An industrial or trading clique, commonly associated with large inudstrial conglomerates such as Mitsubishi, Mitsui or the Sumitomo group. Could be compared to General Motors or Chrysler in size and diversity. |
| "A" SCHOOL | Founded by prefectures to serve as introductory training schools for technical and vocational schools. Prerequisites |

were primary and secondary public school education. Usual entrance age - 14 years old plus higher Primary school Diploma (ie Grade nine) or eight years of education.

"B" SCHOOL — Founded by local communities such as cities, towns or villages. Originally considered to be on same level as "A" school graduates, although only requiring 4 years of education. Considered as secondary vocational schools after 1908. Usually had an entrance entrance age of 10 years old.

# CHAPTER II

## JAPAN IN TRANSITION 1878 TO 1980

### INTRODUCTION

Chapter I presented all phases of the research design for the study, as well a listing of definitions for the terms that will be used throughout this report.

This chapter will provide (1) the geographical setting and an historical overview of the problems faced by the Japanese people; (2) an overview of the changes Japan has undergone from her feudal origin to her present modern industrial society; (3) an examination of Japan's ecomonic recovery from World War II to the present; and (4) the impact and relationship of the above factors on the development of industrial and vocational education in Japan.

In his introduction to MAN, SCIENCE AND TECHNOLOGY, Dr. H. Ziel notes that "Authors, educators and other experts indicate that the past decade, as well as the next, exposes us to a new post-industrial era, a super industrial phase, a reformation or a new conciousness." He also notes our "preoccupation with quantity as a measure of living standards at the expense of a quality standards of living."

Judging from evidence presented in this thesis the Japanese have begun to face these problems and to spend an

increasingly large amount of their Gross National Product on increasing the quality of their lifestyle, as contrasted to mere quantitative increases in the Japanese citizen's living standards.

Japan may be unique in applying the ideas given by Dr. Ziel in MAN, SCIENCE AND TECHNOLOGY. This should not be taken to imply that MAN, SCIENCE AND TECHNOLOGY is being used as a planning document by the Japanese but rather that the Japanese have reached similar conclusions to those of Dr. Ziel's publication in MAN, SCIENCE AND TECHNOLOGY. The notion of appreciating ones past performance as well as future directions is a central theme in both Dr. Ziel's book and the Japanese economic and educational planning documents which are outlined in this thesis.

Whereas in the North American population, the worker, manager, educator and government offical appears to be wedded to the status quo based in part on what seems to be a fear of embarking on new and untried directions, the Japanese have been forced, both geographically and historically to incorporate the ideal of continuous change in their working environment coupled with an adherance to status-quo in their personal, political and spiritual environment.

An example of the North American resistance to change may be found in the auto industry at both

managerial and worker level. Management appears to be more interested in appealing to governments for artifical protection from external competetion than in serious re-examination and overhaul of their own structures, while labor appears to place it's major emphasis on the ideal of holding current job environments rather than embracing the latest technology. The rigid journeyman or craft union structures oppose any easy movements from one skill or job discription to another by the individual. The current vocational training programs within our schools in Canada perpetuate this rigidity rather than introducing flex-ability to the work environment.

On the other hand Dr. Zeil's major emphasis in MAN, SCIENCE AND TECHNOLOGY is on the creation of flexible individual workers who are able and capable of switching from one skill to another with minimal difficulty. It would seem that Japan agrees with this concept. The Japanese concept that people are the greatest resource that a country possesses is well stated by Tanaka:

> In Japan, perhaps to a greater extent than anywhere else, people are viewed as assets. Since the early days of industrialism the concept that enterprise is people has been particularly emphasized is a factor which has contributed significantly to the postwar Japanese economic and educational growth. For many Japanese companies it became apparent that recruitment and development of human resources was crucial as never before to their survival and their economic conditions of recent years. (Tanaka, 1978, p.1)

Nonetheless it should be recorded that in spite of a generalist, futuristic approach which tends to emphasize a high degree of academic achievement, the foundation of Japan's education sytem is still rooted in Mori's concept of education.

(1) Education for enriching and strengthing the state

(2) Education for enlightment designed to alter the whole consciousness

(3) Education for maintance of Japans' national policy (Aso and Amano, 1972, p. 17-18)

At no point is education viewed as a means of enriching the individual for the individual's sake. Rather, education of the individual is viewed as a means of enriching the nation of Japan. The reader should be aware that Mori's educational system was an outstanding creation. The organizational structure and idealistic philosophy behind it was to affect the minds and personalities of the Japanese until the end of the Second World War. "No part of it was self-contained. The functions of all components in the system -- elementary, middle, normal and vocational schools as well as the university were vitally interrelated." (Michio, 1971, p. 187)

A proper appreciation of Mori's accomplishments may be attained if one places the Japan of the 1870's into a "third world" context today as compared with the

industrialized Western nation.

Since Japan was in the process of acquiring new, modern industries previously unknown in Japan, a plentiful source of highly skilled, highly qualified technical staff, locally available was a prime necessity. This view is reinforced by the Japanese experience with foreigners hired on contract to run some of Japan's new industries. Since a great many of the foreign technicians, demanded exorbitant (in Japanese eyes) wages, while in many cases, proving to be incompetent and incapable of performing the tasks expected of them, the training of Japanese technicians was given a new urgency.

> The promotion of vocational education (an effort to which the leaders of the Meiji government gave considerable attention) can be understood from much the same point of view as that from which we consider the inclusion of technical courses in Tokyo Imperial University. Vocational education was the most progressive aspect of Mori's educational policy, and his concern with strengthening this part of the system was shared by Mori's successor; one Inove Kowashi (who assumed Mori's responsibilities after Mori was assassinated.) (Nagai, 1971, p. 193)

The reader may infer then that although the flexible character of the Japanese people has had a great influence on their progress within the past one hundred years, Japan was also exceedingly fortunate to have produced an administrator of Mori's stature and foresight.

## GEOGRAPHY

Japan consists of four main islands - Hokkaido, Honshu, Shikoku, and Kyushu, lying off the eastern coast of the Asian continent, stretching in an arc 3800 kilometers long. (See Appendix I for maps.) In addition, a number of island chains are included in Japan's total land area of 377,384 square kilometers.

| Area of Main Islands | (km. 2) |
|---|---|
| Hokkaido | 78,513 |
| Honshu | 230,722 |
| Shikoku | 18,772 |
| Kyushu | 41,993 |

In terms of world land area, Japan occupies less than 0.3 per cent. (Ministry of Foreign Affairs, Japan, 1971, p. 5-6)

## CLIMATE

The islands of Japan lie in the temperate zone and at the northeastern end of the monsoon area, which reaches as far as India from Japan through Korea, China, and Southeast Asia. The climate is generally mild, although it varies considerably from place to place, largely due to the continental air currents from the northwest dominating the winter weather, and the oceanic air currents from the southeast dominating the summer weather.

The four seasons are clearly distinct. Summer is warm and humid, and begins around July, following a rainy season which lasts for about a month. Except for the northern part of Japan, winter is mild. Spring and autumn are the best seasons of the year with mild weather and many sunny days. (Ministry of Foreign Affairs, 1971, p. 6) The combination of plentiful rainfall and a temperate climate produces rich forests and a luxurious carpet of vegetation The climate of the northern region of Hokaido is similar to that of Alberta, while the more southernly islands approximate the climate of California.

TOPOGRAPHY

These climatic advantages are offset in a sense by the complex topography. The Japanese islands are part of the "Circum-Pacific Orogenic Zone" which runs from Southeast Asia through Japan to the Aleutian Islands and Alaska, then down the west coast of the United States and Canada. This has given Japan a long rocky coastline with many small but excellent harbors. It has also created a large number of mountainous areas with numerous valleys, rivers and lakes. Mountains account for about 80 percent of Japan's total land area. Overall, Japan's topography provides outstandingly beautiful scenery, with mountains, rocky gorges and waterfalls. (Ministry of Foreign Affairs, 1971, p. 6)

## NATURAL RESOURCES OF JAPAN

Japan's major natural resources are agriculture, forestry, fisheries and hydroelectric power. Although Japan possesses a favorable climate and magnificent scenery, Japan is very poorly endowed with mineral resources and lacks most of the metals necessary to sustain a modern industrial structure. Japan's main mineral resource is coal; however, this is mostly low-grade bituminous coal unsuitable for most industrial applications. Twelve other types of minerals are also mined on a fairly wide scale, but most of them are in quantities barely sufficient to meet minimum domestic demands. (Ministry of Foreign Affairs, 1971, p. 46) As a result, Japan's major resource has become the expertise and resourcefulness of her people.

## THE JAPANESE PEOPLE

Japan has been called the world's most rapidly changing society. At the same time, the Japanese people are imbued with traditions that reach back over 2600 years. History and tradition, far from imposing barriers to change, have actually stimulated change in Japan in a manner quite unlike most other nations. (Japan of Today, 1976, p. 93)

Throughout their long history, the Japanese people have shown a great aptitude for assimilating and adapting new ideas to their particular needs. This aptitude would

seem to stem from the history and geograpy of Japan, which has created an unusally homogenous population. Over the centuries, they have developed institutions, customs, and characteristics which have given them a strong sense of national identity and common, national purpose. (Kahn, 1970, p. 8) This commonality of national purpose promotes respect for structure and authority that at once promotes harmony in the social structure while stressing education and individual excellence in whatever enterprise is undertaken. Ike notes that:

> Despite the social leveling which has undoubtedly occurred, the sense of hierarchy and respect for seniority remains strong. Most Japanese value the principle of achievement and are accordingly, highly competitive. Still, the group is dominant and Japanese society is remarkably structured. (Ike, 1973, p. 27)

Further, the ideal that "Maximizing the power of the group increases the maximum power of the individual" is a widely held ideal amongst the population and the managerial structure. (Access T.V., "Inside Japan" December 8, 1982) The strength and stability derived from these unifying features of national life have helped Japan to undergo two major transformations within the last one hundred and twenty-five years, first in the middle to late nineteenth century when Japan threw off a stagnant Shogunate to start down the road to moderization; and again in the late nineteen-forties to rebuild a shattered country from the ashes of defeat in the Second World War. It should be

noted that the feudalistic Shogunate was a decentralized system with a number of local nobles or daimos administrating their districts. While the Shogunate demanded strict obedience and loyalty in political and military affairs, the local prefectures or districts were free to set their own standards and to run their own affairs in whatever way they wished. The overthrow of the Shogunate had a centralizing effect on Japan, with a much greater emphasis on centralized control of education, language and national goals. For those unfamiliar with Japanese history, a good parallel could be found in Otto Von Bismark's unification of Germany. Although these two periods were almost revolutionary in the nature of the changes in both political and social structure, these changes were accomplished without discarding most of the traditional roots of Japanese society or of impairing social continuity.

The traditional roots of Japanese society include group solidarity and a Sempai-Kohai system which stresses a system of social obligations of individuals to each other and for superiors or subordinates within a localized or job-related group. This Sempai-Kohai relationship appears to begin at an early age. In fact, it begins in elementary school where, one or more junior members of a class group will attach themselves to some more senior student who is regarded as popular or possessing

leadership qualities of some type. The Sempai will provide protection or guidance to the junior student while receiving support and recognition from the junior student. The system carries on through junior and senior high school and into adult life where a new member of a work force will be assigned to a more senior member who will provide him with guidance and support (that is. "show him the ropes"). As before the Kohai will accord his Sempai respect, support and recognition. In some ways the system might be compared to that of a King-vassel relationship in medieval Europe.

Nakane points out the Sempai-Kohai system has become a subsitute for Kinship relationships found in other countries. Furthermore, both Sempai and Kohai feel a strong attachment to the organization or company with whom they are employed, as an extension to their localized group.

Nakane in the definitive work JAPANESE SOCIETY points out that:

> The Kinship which is normally regarded as the primary and basic human attatchment seems to be compensated in Japan by a personalized relation to a corporate group based on work, in which the major aspects of social and economic life are involved. Here again we meet the vitally important unit in Japanese society of the corporate group. In my view, this is the basic principle on which Japanese society is built (Nakane, 1970, p. 6)

POPULATION DENSITY - 1971

The density of population in Japan is 280 persons per square kilometer, ranking Japan fifth in the world after the Republic of China, the Republic of Korea, Belgium and the Netherlands, in that order.

At present about 70 percent of the Japanese people live in cities. Of this urban population, 58 percent is crowded into the "Big Three" metropolitan industrial areas of Tokyo-Yokohama, Osaka and Nagoya. The remaining are mainly concentrated in smaller town and cities throughout the rest of Japan.

POPULATION STRUCTURE - 1965

Before the war (1930) those 14 and under formed the greatest sector of Japan's population. By 1965 the proportion of children had decreased and accounted for only 25.6 percent of the total population. The adult (15 to 64 years old) poulation stood at 68.3 percent, while the aged population (65 and older) stood at 6.3 percent. In 1965, the nation's population of productive age reached an all-time high of 65 million. (Ministry of Foreign Affairs, 1971, p. 77)

LABOR SUPPLY 1955 - 1975

The availability of a large, well-educated, well-disciplined labor force contributed immeasurably to the reconstruction of the economy and its subsequent growth.

In the course of Japan's rapid economic growth after the Second World War, the demand for labor rose sharply, centering on the more modern industries. At the same time, the supply of new labor increased with the expansion of the productive-age population and much greater labor mobility.

A major contributing factor to the supply of labor in those years was the widespread and heavy outflow of the agricultural population to industry. (Ministry of Foreign Affairs, 1971, p. 41)

A decline in the postwar birth rate and a rise in the ratio of secondary school graduates advancing to institutes of higher learning had created a growing labor shortage, especially among young workers. (Ministry of Foreign Affairs, 1971, p. 42) The following breakdown indicates the changes in the ratio of employed workers:

TABLE 1 - DISTRIBUTION OF EMPLOYED WORKERS

| Year | Primary Industries | Secondary Industries | Tertiary Industries |
|---|---|---|---|
| 1955 | 40.1 | 24.0 | 35.9 |
| 1960 | 32.5 | 27.8 | 39.7 |
| 1965 | 23.5 | 31.9 | 44.6 |
| 1970 | 17.4 | 35.3 | 47.3 |
| 1972 | 14.8 | 35.7 | 49.4 |

(Okita, 1975, p. 26)

This shift of younger people from rural areas to urban environments has resulted in a depopulation trend in the rural areas. The consequence of this shift means that

the age of the remaining population in the rural areas is increasing with the possibility of reduced agricultural production and an increased reliance on imported goods (particularly food).

## THE MEIJI ERA (1868 - 1912)

The Meiji Era represents one of the most remarkable periods in the history of the world. Under Emperor Meiji, the country set out to achieve in only a few decades what had taken centuries to develop in the West - the creation of a modern nation with modern industries, modern political institutions and a modern system of education.

Under the Emperor Meiji, a constitutional monarchy was established in Tokyo. The old feudal system was legally abolished in favor of a democratic state based on Western ideals. The legal distinctions between samurai and commoner were abolished and the samurai were encouraged to "take up useful occupations" (Ike, 1973, p. 21) The twin military victories over China in 1894-1895 and Russia in 1904-1905 resulted in the acquisition of Formosa and Korea as colonies (and markets), while also stimulating Japan's industrial capacity through a drive for self-sufficiency in military supplies (Ike, 1973, p. 22)

THE TAISHO ERA (1912 - 1926)

The First World War era provided an excellent opportunity for industrial and market growth for Japan. Industries were kept busy supplying materials to the Allied forces while the former consumer markets held by the European combatants were, to some extent, filled with Japanese goods. Some idea of the scale of these sales may be gained from the sale by the Japanese of 500,000 rifles to England during World War I and 600,000 rifles to Czarist Russia between 1914 and 1916. Ammunition and other accessories would have probably been included in the shipments, which would have helped the Japanese economy considerably. Furthermore, one can surmise that these sales would have required the creation and maintenance of a large, skilled workforce to manufacture the rifles and accessories involved in these transactions. These production facilities were kept busy after 1918, with rifles, pistols, machine guns and light cannons being aggressively marketed throughout the world up until the outbreak of the Second World War in 1941. An English language catalogue printed in 1935 was made available through the Taichei Kumai (Great Peace Association) in order to promote sales and to maintain a strong industrial arsenal system. (Honeycutt, 1935, Japan) Japan continued to supply some of the Asian colonies and territories held by the European colonial powers after World War I. At the same time,

Japan acquired some of the former German island colonies as a result of the help Japan gave to the Allied Powers during World War I, and hence new markets were obtained for Japanese goods. (Kennedy, 1972, p. 10,11)

THE SHOWA ERA (1926 - Present)

During this period Japan underwent some of the most drastic changes in her entire history. The world-wide economic depression of the 1930's had severe effects on Japan's economy. The wave of protectionist trade policies followed by a large segment of the world's trading nations had a very harsh effect on Japan's new industries. Although Ford and General Motors had established limited auto and truck production in Japan, sales were generally limited to the Japanese market. Partly to gain new markets, and partly to follow in the footsteps of the Western powers, Japan undertook an imperialist expansion to gain new colonies. These efforts were directed at first toward China, and resulted in Japan's acquisition of Manchuria in 1934 as a colony, in addition to Formosa (1895) and Korea (1905). Japan's economy was devoted to ever larger armaments production. The automotive, construction machinery and shipbuilding sectors were increasingly controlled by, and were suppliers to, the military. For example, prime movers such as catapillar-style full-tracked tractors varying from three tons in weight up to fourteen tons and having brake horsepower

outputs of seventy horsepower up to two hundred and sixty five horsepower were manufactured to commercial standards in Japan from 1927 to 1945. (Handbook on Japanese Military Forces, 1944, United States War Department, p. 291-294) Furthermore, an active program existed to train both military and civilian personnel for the maintainence of mechanical equipment used by both the civil and military authorities, with special exemptions from military service for persons possessing specialized skills deemed useful to the nation at war. (Handbook on Japanese Military Forces, 1944, United States War Department, p. 4,5) At this time, (1935-1945), a number of armaments-related courses were offered to students in the vocational schools and in the technical colleges, in order to help bolster armaments production.

The war with the United States resulted in some early successes, but ended in the economic, and to a large degree, the physical destruction of Japan. The industrial sector was almost completely destroyed, the transportation system was very badly damaged, large segments of the population had no shelter, and food supplies were very short. The years 1945-1955 were years of foreign occupation and great hardship for the Japanese population. (Ministry of Foreign Affairs, 1973, p. 75)

POSTWAR RECOVERY 1945 - 1955

During the period of 1945 - 1951, the Japanese accepted the occupational authorities' recommendations for the rational and organized recovery of the Japanese economy under the Dodge Plan (Ministry of Foreign Affairs, 1976, p. 7) The Dodge Plan was a joint product of the occupational authorities and Japan's new government. It was designed to impose severe financial controls on the economy. The result was substantial progress in the fight against inflation and in decontrolling the economy. Rationing and price controls were ended, and the Japanese economy was returned to a free state. In addition, the exchange rate of American dollars to Japanese yen was fixed at 360 yen per dollar. (Ministry of Foreign Affairs, 1976, p. 7) From 1949 through the early part of 1950, inflation decelerated, and significant progress was achieved in the stabilization of prices and the currency.

The Korean War (1949 - 1951) in which the United States became heavily involved provided new opportunities for the Japanese economy under the offshore material procurement programs used by the United States to acquire needed supplies from local sources for the United States Forces Overseas. (Ministry of Foreign Affairs, 1976, p. 8) The Korean War brought an economic boom to Japan, with the international balance of payments problems from the aftermath of the Second World War largely solved by the

massive war-related supply orders from the United States for use in the Korean theatre of operations. Under the circumstances, the United States discontinued economic aid to Japan at the end of June, 1951. (Ministry of Foreign Affairs, 1976, p.8)

Japan's balance of payments with foreign countries which had been disastrous in 1945 achieved equilibrium in 1951. The post-war Japanese economy had completed its reconstruction phase in 1951. The post-war recovery accomplished, Japan now undertook a series of programs designed to modernize key industries. These were the first and second steel industries rationalization programs, the five-year electrical development program, the three-year coal rationalization programs, and the programs strengthening synthetic fibre production. (Ministry of Foreign Affairs, 1976, p. 10)

The years 1955 to present have seen the Japanese economy dominated by a series of rational economic plans in which realistic and achievable goals have been set out and accomplished. These plans have been undertaken for periods varying from five to ten years, and have been directed as much at the control of the Japanese economy, as at its uncontrolled expansion. (Ministry of Foreign Affairs, 1976, p. 20) The characteristics of these plans are summarized by Saburo Okita. Saburo Okita writes: "To obtain a ready overview of these economic plans, it is

convenient to classify them in three categories, in accordance with the stage of economic recovery and development:"

(1) Rehabilitation Plans

(2) Self-Supporting Economy Plans

(3) Development Plans

(Okita, 1976, p. 70)

## THE REHABILITATION PLANS

These plans emphasized reconstruction of the war-ravaged economy, and measures to combat chronic, rising inflation. The damage wrought by the war took such forms as isolating Japan from external markets, severing the supply lines by which Japan imported materials and products from traditional sources, destroying transportation and communication facilities and creating a considerable degree of unemployment.

To stabilize and reconstruct the economy, institutional changes within the government were necessary. The Economic Stabilization Board was established in 1946. This board, which was organized as the Economic Deliberation Agency in 1952, is today's Edonomic Planning Agency which was created by reorganizing the Economic Deliberation Agency in 1954. The Economic Rehabilitation Plan (1949 - 1955) was prepared in 1948. This plan was not officially adopted by the government, but served to provide background information for the government to use

in requesting economic aid from the United States. This period of rehabilitation and recovery lasted nearly five years, and included a short recession in 1949.

Japan benefited from the windfall of dollar revenue from the United States military procurement of goods and services during the Korean War 1949 - 1951. This foreign exchange income closed the gap between normal export and import requirements.

Saburo Okita writes:

> Under these circumstances, the idea gradually took hold in the government that the Japanese economy could not and should not be dependent on such windfall sources or on foreign aid for it's foreign exchange needs, but should stand on a self-supporting basis. (Okita, 1976, p. 71)

In line with this thought, a series of plans were developed for the future which tended to phase out the rehabilitation plans for repairing war damage in favor of developing stable markets and stable sources of raw materials in order to sustain long-term growth. The availability of large numbers of skilled workers was a vital ingredient of these plans although not always acknowledged in the official documents.

## ECONOMIC SELF SUPPORT PLAN

The first plan was officially adopted by the government in 1955 as an important means of coordinating government economic plans and activities. The economy

experienced a boom; the growth rate was nearly double that which had been envisioned in the plan and many of the plan's targets were attained within the first two years of the five year plan.

NEW LONG RANGE ECONOMIC PLAN (1957)

In 1957, industrial production had recovered to pre-war (1934 - 1936) levels, and the economy passed from the "recovery" stage to one of developement. In December, 1957, the "New Long Range Economic Plan" was proposed.

On the basis of the character of the plan, it would be necessary to restrict to the minimum direct controls by the government, and give private enterprises as much latitude as possible. This recognized that the private sector was the source of motive power for the development of the economy. For its part, the government undertook development of Japan's infrastructure and improved roads, railway and port facilities and other capital projects beyond the capacity of private enterprise. (Okita, 1976 p. 72)

While this plan set the growth rate at five percent per annum, this figure proved to be short of the actual growth rate. The Gross National Product growth rate from 1958 - 1960 proved to be ten percent per annum rather than the five to six point five percent planned.

The three main reasons for this faulty estimate were greater than anticipated export volume, greater than

anticipated capital supply, and greater than anticipated goods production.

LONG RANGE PROSPECT COMMITTEE ESTABLISHED (1959)

In reaction to the larger than planned for growth rates, the Long Range Prospect Committee was established in 1959 which attempted to set targets for Japan in the 1980's.

NATIONAL INCOME DOUBLING PLAN (1958)

As a result of the 1958 - 1960 economic performance, the National Income Doubling Plan was initiated with the aim of doubling the population's income in less than ten years with the plan period set as 1960 - 1970. This plan set a seven to eight percent annual growth rate as a reasonable target and emphasized five points as major long-term policies: (Okita, 1976, p. 74)

(1) Improvement of overhead capital was considered necessary to restore a balance between private and the public sector by accelerating development of roads, harbors, water supply, sewage system, and low rental housing.

(2) Inducement to achieve a highly industrialized seconday industry, heavy industry, and chemical industry, particularly the machinery industry. This inducement took the form of tax concessions and government-backed investment.

(3) Promotion of exports and strengthening of economic developement with underdeveloped coutries was undertaken with the expectation that exports would grow at ten percent per year as opposed to eight percent Gross National Product growth in order to compensate for the loss of United States off-shore procurement orders.

(4) Development of human resources and the advancement of science and technology to be promoted by increasing the number of university graduates in science, technical college graduates in engineering, and vocational training teachers.

(5) Resolution of conflict between the dual-economic structure and the securing of social stability.

The dual economy a is characteristic of the Japanese economy and carries within it the ultra-modern and the pre-modern sectors. This structure has in part been the foundation of Japan's competitive strength, while at the same time a source of inequality and backwardness in Japan's social structure. Therefore, as the economy continues to modernize, the dual structure tends to limit progress in improving technological efficiency because of the reliance on human labor in the pre-modern light industries sector. As an example, the Globe Pencil Company of Tokyo uses two small subcontrators to handle extra production orders and to perform specialized tasks.

One small company has a workforce of three, two workers and one manager. Their function is to paint the pencils and inscribe the Globe Pencil Company's name on the pencils. The second small company has a workforce of five persons, and is a family-run organization. This small company specializes in installing the erasers and the metal sleeves on the ends of the pencils. ("Inside Japan", Access T.V., December 15, 1982)

The small companies do not have the economic strength of the large companies, hence are not able to offer the life-long employment or fringe benefit packages to their employees that the large companies offer. Therefore, to both skilled and unskilled workers, the small companies are very much a second choice amongst employers, and act to employ those persons not hired by large companies. Approximately one third of Japan's workforce is employed by large companies while two thirds of the private sector employees are employed by small companies having less than one hundred and fifty employees. ("Inside Japan", Access T.V., December 15, 1982) There is a further dual structure which comprises the private and public sector of the economy. In the public sector, long-term economic planning is linked with allocation of funds for major public works. In the private sector, the long-term plans take the form of tax incentives or in legal incentives.

Another feature of the plan is the emphasis on long-term planning. Planning in Japan characteristically aims at providing guidelines for economic activities to be carried out in a system that is basically one of free enterprise. It does not aim at fixing detailed targets for long-term policy, but instead focuses on general long term policy measures. (Kahn, 1971, p. 50, 81) In this connection, the new plan included numerous policies and recommendations related to institutional and organizational reforms.

Further features involved the attempts to remove disparities of income between large and small industries, and between different regions of the country. The importance of the human factor for economic development was also emphasized. Education and training facilities were studied in connection with adopting Manpower Policies for economic development. (Okita, 1976, p. 77)

The Income Doubling Plan did not perform entirely to expectations of the planners. For example, during the first three years of the plan, the actual Gross National Product growth was eleven percent as opposed to the planned seven to eight percent growth. Since modifications of the policy were required to take account of the new realities, a new short term plan called "Medium Term Economic Plan" was drafted and adopted. The major aims were to cope with the new conditions, notably labor

shortage and a shift to a more open-door foreign trade policy. (Okita, 1976, p. 78-81)

MEDIUM TERM ECONOMIC PLAN - 1965

After the Medium Term Economic Plan was adopted the economy was slowed by recession by 1965. The plan projected a two point seven percent rise in consumer prices, however, consumer prices rose faster than the plan had forseen. (Five percent in 1964, seven point two percent in 1965). The result was a speeding up of the economy, and the recession was over by late 1966. Recovery took place, and the Japanese economy performed as had been projected in the plan. (Okita, 1976, p. 81)

Accordingly, another short term plan (1966 - 1971) was adopted. Its main thrust was to decrease the rise in consumer prices to three point seven percent per annum by the end of the planned period (1970). Also promoted were improved housing, dealing more effectively with pollution, and the more effecient use of land by the construction of naionwide transportation systems and communication networks. Economic growth was planned at eight point two percent. (Okita, 1976, p. 83)

NEW ECONOMIC PLAN 1970 - 1975

The new economic plan 1970 - 1975 projected economic growth at eight point two percent per annum with the following aims:

(1) Stabilization of prices, (2) Redevelopment of foreign policies, (3) Renovation of the industrial standards from a long term and international point of view for promotion of social developments, forward-looking attempts to evaluate the high potential growth capacity of the Japanese economy, and to try to simultaneously attain high economic growth, price stability, and social development. (Okita, 1976 p. 83) In connection with the New Economic Planning Herman Kahn wrote:

> The Japanese were also willing to be astonishingly ruthless in getting rid of inefficient industries, or those that were somehow not suitable. They [the London Economist newspaper] pointed out that there were certain kinds of industries the Japanese thought of as "throw-away industries", because not only was Japan no longer competitive in these industries but she regarded it as a mistake to try to gain a competitive position. (Kahn, 1971, p. 80)

Kahn lists these "throw-away" industries as those that the Japanese considered themselves as uncompetitive in such as coal mining, non-ferrous metals production, paper pulp and agricultural products, with cotton textile, simple sewing machine and simple bicycle production being relegated to a position of "no longer wishes to compete" with other countries. Kahn points out that the "smoke-stack" industries such as shipbuilding, iron and steel, railroad, optical equipment and truck or buses are still regarded as essential to Japan's growth. The high-technology industries such as computers, electronics, precision tools, automobiles and large-scale construction

equipment were targeted as those receiving "official stimulus".

Kahn notes that:

> While the Japanese were not quite as ruthless as the term "throw-away" indicates, they were very close to it. In fact as indicated by the second set of items, the early-stage industrial sector, there was a strong belief among many Japanese that certain activities - manufacturing simple white cotton textiles, for example, or simple kinds of sewing machines or simple bicycles or pottery - should be deliberately forced to the wall by government financial practices, even though they might be kept in competitive status. Therefore, the companies had to release men, materials, and resources for more efficient industries. It is, of course, exactly this transfer from the less efficient to the more efficient sectors that facilitates rapid economic growth. (Kahn, 1971, p. 81)

Japan realistically assesses the fact that other coutries having lower wage scales that Japan are able to compete more effectively, in high labor intensive type industries. The Japanese government and the economy in general therefore work to discourage the continued existence of these industries in Japan.

Kahn further writes: "These are not for Japanese", (Kahn, 1971, p. 80) meaning that Japan does not have the desire or need to maintain interest in obsolete industries.

Alterations and modifications of some of Japan's economic plans plus some trade-offs imposed on the economy by outside forces are almost unavoidable. Therefore, economic, social and educational planning on a continual

update basis are a central pillar of the Japanese economic, social and political system.

## SUMMARY

Japan is a country that is relatively very young industrially, but it possesses a long, rich and varied history. Japan has progressed from a group of islands in self-imposed isolation, living in a closed, agrarian society, suffering from total industrial destruction in World War II, to becoming the third largest economy in the world. Today, with a highly educated, highly competent industrial work force, Japan has achieved one of the highest standards of living in the world. Japan developed its industrial structure in line with numerous changes in the world's trading patterns, while government financial planning gave confidence and support to the private entrepreneurs. Combined with keen competition amongst private companies, this has sometimes led to over expansion of the economy, necessitating adjustments. (Okita, 1975, p. 88)

These plans have also opened up a new scope of economic implications for education and social policies and have had important influences upon the thinking and policy making of the government in these fields. As a whole, economic planning in Japan has not been designed for stimulating rapid growth, but rather for attaining balanced growth and long term economic goals. (Okita,

1975, p. 88) In spite of small "bumps" and "valleys", these plans have been followed successfully.

# CHAPTER III

# THE DEVELOPMENT OF VOCATIONAL AND TECHNICAL EDUCATION IN JAPAN

## INTRODUCTION

The second chapter of this study was written to give the reader some insight into Japan's history from 1878 to 1980 and the economic growth of Japan which has played a significant part in shaping Japan and its educational system.

The first section of this chapter will describe the development of Japan's education system. This background was included in the study to give the reader an insight into the intimate interrelationship of the education system, its development, and the development of technical and vocational schools, with the industrial and economic development of Japan.

In addition, this chapter will describe the vocational structure of the national school system of Japan, including some relevant acts having to do with the development of the technical and vocational education of Japan.

## EARLY ORIGINS OF JAPANESE VOCATIONAL EDUCATION

The United Nations Educational Scientific and Cultural Organization Committee of 1966 writes:

> Japan entered its rapid development stage around 1880, about 30 years after the visit of the "black ships" in 1853 and approximately ten years after the Meiji restoration of 1868. During this period, the industrial revolution centering on railways and heavy industry took place in the developed nations of the West. Japan quickly learned the most progressive ideas of that time. In addition, she became the first nation to use a national school system as a strategic factor in her industrialization. (Japanese National Commission, 1966, p. 6)

During some periods, education preceeded growth, while during other periods, educational expansion and repletion were caused by economic growth. As Japan entered the process of self-sustained growth, education and industrialization became increasingly interdependent.

Vocational education in Japan, although only really visible within Japan during the period 1880 - present, in fact existed in earlier periods. The very large intricate wooden structures visible in present-day Japan date back over a thousand years. An excellent example is TODAI-JI, a very large wooden temple containing an enormous bronze statue of Buddha located in the old Imperial Capital of Japan at Nara. Even a casual examination of the statue and its' protective housing reveal a high standard of workmanship for the period (700 - 900 A.D.)

The skills required for these projects were largely passed on from father to son or apprentices, hence a craft school was run on a very limited scale. (Helvoort, 1979, p. 19) A rather elementary specialization of skills was beginning to evolve, so an informal apprenticeship system based on the family came into usage.

> The recognized social organization of Japan was that of the paternal or family basis. There grew up, very naturally, the custom of perpetuating the family occupation. In order to make this possible there developed a certain form of education for the children of the various clans. As yet, however, there was no such educational organization as might be termed a formal vocational school. (Hall, 1971, p. 206)

The only formalized schools in use at the time were directed at the training of Samurai warriors rather than industrial production, since the warrior's occupation was judged by the military classes as being the only vocation requiring formal education.

These schools were held in the Buddhist temples, with the emphasis being mostly on classics, strategy, swordmanship and court etiquette. This sytem did not endure beyond the 1850's due to societal changes and the consequent obsolescence of the curriculum.

> The Japan of 1868 was a very different society. The warriors' scorn for the effeminate world of books was hardly anywhere in evidence. Practically every samurai was literate, most had at least a smattering of the basic Chinese classics, some were learned in Chinese literature, philosophy or history, in Dutch medicine, astronomy or metallurgy. They were educated in great secular schools. In 1870, an American who went to teach at one of these schools described

> his great surprise on finding it so large and flourishing, having in all about 800 students. Courses [were] comprised [of] English, Chinese, Japanese, medical and military subjects. (Dore, 1965, p. 2)

From the 1600's until the 1870's the major emphasis of education was to be able to pass the many tests used in order to obtain certification as educated samurai, rather than to gain practical knowledge which would be of every-day use. This situation underwent a radical change, in response to the rapid societal changes ocurring in Japan.

> In the 1870's education became a different matter; students were learning something new, something their fathers did not know. They had clear objectives held out before them, their own personal advancement and the strengthening of their nation. The contrast between education in 1770 and the education in 1870 is enormous and the Meiji Restoration was largely responsible. (Dore, 1965, p. 152)

ARINARI MORI

In 1885, Arinari Mori was appointed as the new Education Minister. Mori was, according to most Japanese scholars, an outstanding choice for this post, since he laid the basis for a new and revolutionary (for Japan) education system.

Arinari Mori was a samurai born near Kagoshima in the southern island of Kyushu in 1847. He studied the English and Chinese languages in his youth and went to England in 1865 to study mathematics and chemistry.

In 1868 he returned from England and entered the Japanese government civil service. In 1870 he was

appointed First Minister to America and in 1875, First Minister to China. In 1879 he became First Minister to England and in 1885, Minister of Education for all of Japan.

> Even today, the boldness of Mori's progressive concept of reform is startling. For Mori the West meant first of all, nations with wealth and a strong military; democratic individuality and freedom were of secondary importance. (Nagai, 1971, p. 174)

The creation of Japan's education system is considered Mori's most outstanding achievement. This achievement was by no means an easy task. Most of Mori's contemporaries regarded him as being much too revolutionary in his ideas; a situation which did not deter Mori from continuing to advance new and unorthodox ideas. In his admiration for the West, Mori had become acutely aware of the difficulties inherent in modernizing the Japanese language. As a quick remedy, Mori proposed the "elmination of the Japanese language and replacing it with the English language." (Nagai, 1971, p. 172)

Mori felt that the time element in the modernization of Japan was critical and that the choice for Japan was either to modernize immediately or perhaps to be dominated by the European colonial powers of that day.

Mori considered that the future modernization of Japan consisted of a number of elements. These were:

1. Modernization and stabilizing of Japan through science, technology and industry.

2. Vigorous commercial enterprises lay at the base of a wealthy nation. He therefore proposed the establishment of a technical school and when the government declined, used his own resources for constructing the Tokyo School of Commerce (known today as Histotsubashi University)

3. The crucial importance of universal education and the fundamental skills of reading, writing and mathematics.

4. The development of normal (teacher's) schools to train Japanese teachers to replace those foreign teachers hired on contract at the time.

5. The establishment of a school of engineering within Tokyo Imperial University.

6. The establishment of military-style physical education as a regular part of school curriculum. (Nagai, 1971, p. 174)

> Mori's concept of an educational system was three-dimensional. The respective roles of the universities, normal schools and primary schools became clear only when one sees them not as separate entities but in relation to the total system. Considered from another angle, this dual-structure educational system corresponded to to the dual-structured class system of Japanese society. Primary school education was compulsory for all Japanese citizens. The free normal school enabled those with ability to achieve higher academic levels and allowed persons from a low social status to rise to a high social class. (Nagai, 1971, p. 179-180)

The universities then were left to those with exceptional ability or with the money to pay for this type of education.

> The Primary School Order issued in April, 1886, completed the foundation of the primary education system. In the following month, regulations for primary education subjects were laid down for textbooks and subject matters. Primary education was divided into ordinary primary schools (4 years) and higher primary schools (4 years). These names survived until 1941 when the national schools were created. (Japanese National Commission, 1966, p. 35)

The first four years of education were made compulsory, with junior primary schools of three years education offered as an alternative. School tuition was to be paid by the families or guardians of students. This primary school system was regarded as a necessary prerequisite for further education, particularity vocational education. The overall school system was in many ways modelled on European systems with a strong preference for French and German educational ideals.

> It is believed that the German primary school regulations were used as a guide for the original draft of the Primary School Order of 1886. Three kinds of higher primary schools of two, three and four years course length were established. Apprentice and vocational supplementary schools were included as primary schools. (Japanese National Commission, 1966, p. 36)

In keeping with Mori's concept of a comprehensive reform of the Japanese education system, Normal schools for training Japanese teachers were established. The role of the teacher was seen not as an innovator or reseacher,

but as a diffuser of information and as a bridge between the lower income classes and industry. A national system of textbook authorization was set up and placed in law in 1897 which in turn promoted a national standard of education to which students could aspire and to which teachers could look for guidance.

> The promotion of vocational education (an effort to which the Meiji government gave considerable attention) can be understood from much the same point of view as the inclusion of technical courses in Tokyo Imperial University. Vocational education was the most progressive part of Mori's educational policy, and his concern with strengthening this part of the program was shared by his successors. Mori's immediate successor (Inoue Kowashi) continued the process of completing the system of vocational education and the government was always ahead of public opinion. (Nagai, 1971, p. 193)

Mori's path was not a smooth one and criticism from the more conservative of his countrymen was indeed harsh. In spite of this criticism, however, Mori continued to emphasize "practical learning" or "Jitsu Gaku" as a basis for education.

While the most outstanding example of the forward-looking government policy was the opening of the Tokyo Shokko Gakko (Tokyo Craftsmen's School) in 1881, it was not easy to enroll qualified students.

As Noma Mitsuhiko (a member of the first graduating class) recalled, popular attitudes towards the schools were not very respectful. This was a reflection of traditional upper class societal attitudes which tended to

venerate "philosophy and classics" while denigrating "practical education." He notes that:

> At that time, former samurai families still exercised great influence, and knowledge about industry was not yet very advanced. Even my close relatives and others used to laugh and make fun of the new enterprise, say such things as: "I hear they just started a school for craftsmen. How strange! Is that an academic matter? All such fellows need is to put in some time on the job. If they learn a trade and master their skills, that's good enough." (Nagai, 1971, p. 194)

As a result of these attitudes, the first graduates of the Tokyo Shokko Gakko had great difficulty in securing employment on graduation. The government, however, was determined to achieve the goal of providing qualified personnel for new industries. The government therefore redoubled it's programs to develop vocational education.

Mori expressed the government's view in a speech given as Education Minister:

> It can be plainly and infallibly asserted that our country's status is extremely low, that our national power is terribly weak, and that we are inexperienced in foreign affairs. How can this situation be improved? The only answer lies in reforming the educational system to provide reliable methods of education and learning in order to develop men of character and ability. In times of competition with foreign nations, heedless and selfish men cannot satisfy the urgent needs of the state. (Nagai, 1971, p. 194)

AFTER MORI

After Mori's death in 1889, a new Minister of Education named Inoue Kowashi was appointed. He continued Mori's work and expanded the vocational school system until a network of middle and higher level school was established throughout Japan.

Nagai notes that:

> Despite the government's consistently progressive promotion of vocational education, it should be noted that this progressiveness was limited in two repects. First, vocational education was necessary to the success of national policy. The "strong army" normal school education and the "rich country" policy of vocational education were two wheels of the same cart. Second, in the final analysis, even vocational education was designed to maintain the status quo by providing occupational security for the middle class. It was, in short, education directed at the ruled. (Nagai, 1971, p. 195)

The government under Emperor Meiji did not wish to create a leveling of the class structure in Japan. On the contrary, the social hierarchy was to be preserved with the intellectual hierarchy being directed at preserving the social hierarchy of that day in Japan. The most radical changes in the system were the opportunities created in the education system for some of the more promising members of the lower classes to attend higher schools and universities. This upward mobility, however limited, allowed persons born in the lower classes to gain access to the upper classes through higher education.

> What Education Minister Inoue did was to establish, at middle and higher levels within the educational structure, a "dual system" whereby those who were to proceed to higher levels entered a "preparatory" or "ordinary" course while those who were to join the work force immediately upon graduation were placed in a "vocational course". Thus was born the basic pattern of Japanese education, a pattern that was to survive until the end of World War II. (Nagai, 1971, p. 196)

As a result of this system, a wide social and economic differentiation between the intellectual elite and the common people was perpetuated until the end of the Second World War.

While the basic system conceived by Mori survived for nearly sixty years, the school system contained enough flexibility to incorporate a number of changes, calculated to meet changing needs in industry and society.

Some points of the Japanese philosophy of education should be made clear to the reader. First, the order in which vocational schools and industry were established was the reverse of that in most countries. This was noted in a speech given by one Hamao Arata during the opening address at the Tokyo Craftsman's School in 1881. He pointed out that "In our country we did not have factories and then build an engineering school, rather we are establishing a school of craftsmen to produce graduates, that they might build factories." (Nagai, 1971, p. 218)

In other words, the Japanese, instead of waiting to build a factory and then building a school to produce

skilled vocational graduates for that factory, would build the school first so that graduates from the school could help construct the new factories. Thus, a local supply of skilled labor was made available from the moment of factory start-up. This procedure fitted in well with the Japanese aversion to importing foreigners to fill these positions.

The industrial revolution in Japan proceeded very well, being more or less completed by 1910, although growth continued on an increasing upward curve.

> For instance, iron production in 1905 was twice what it had been ten years earlier, and ten years later, in 1915, it had risen to two and a half times the 1905 figure. Japan's wealth steadily increased. (Nagai, 1971, p. 235)

> In the field of education, elementary school tuition was abolished and by 1910, compulsory education was extended to six years. Attendance figures increased steadily until 98 percent of all school-age children were attending school, thereby making Japan one of the leading countries in the world in this respect. By 1910, 14 percent of the boys and 9 percent of the girls in the appropriate age group were also attending middle school. Japan was thus successful in reaching its early goals. (Nagai, 1971, p. 233)

During the late Meiji and the Taisho periods (1867 - 1925), the agricultural sector of Japan's economy became less and less significant. The agricultural sector had produced one half of Japan's gross national product during 1914 - 1918, but by 1925 (the end of the Taisho period) agriculture accounted for one-quarter of the gross

national product. Industrial production, centered on both light industry such as textiles and heavy industries such as machinery, metals and chemicals, recorded outstanding production levels. The national railroads increased their track distances by over a thousand miles, and both local railroads and highways were also being expanded. Although industry was being centralized mainly in the Kansei (central Japan) area between Tokyo and Osaka, the size of individual industries was small. These were mostly capitalized at under 100,000 yen per industry with less than one percent having more than one million yen per company in capitalization. However, these small companies accounted for almost sixty percent of the total capital of Japanese enterprise. (Japan National Commission, 1966, p. 157)

A Provisional Conference on Education in 1918 submitted a report on vocational education as follows:

1. The existing regulations for vocational education as a whole must be revised.

2. Vocational education must be promoted in accordance with the national and international situation of the country, and appropriate measures - such as increasing state subsidies - should be devised for the promotion of vocational education.

3. Vocational education must not aim only at the mastering of skills. Moral education also must be emphasized and the cultivation of the students personalities must be considered.

4. Administrative agencies for vocational education must be considered.

5. Regulations for vocational education must be more lenient, and must be more practical.

6. Better treatment for teachers of vocational schools is an urgent issue requiring solution.

7. Measures must be taken in order to create a more cooperative relationship between vocational schools and business circles. (Japan National Commission, 1966, p. 157)

## VOCATIONAL SCHOOL ORDER OF 1920

This report resulted in a revision of the Vocational School Order in 1920. The most significant revisions concerned (1) the cultivation of morals and (2) replacement of apprentice schools by trades schools. In addition, changes were made to regulations for vocational schools, altering entrance requirements; upgrading of B or lower class schools to A class only schools; introducing night classes for technology and commerce schools and a two-year school term introduced for agricultural and merchant marine schools. (See Definition of Terms A & B school explanation.)

The growth of industry and transportation created an increased demand for trained workers. Industrial growth reached the point where education no longer led industrial development but rather followed it, with industrial demand setting the direction of skill development for the emerging industrial workforce.

To appreciate the development of Japan's vocational training program thus far, it should be pointed out that

the education system of 1881 which more or less lumped vocational schools, together with other schools, had by 1925 evolved into specialized schools serving industry's needs rather than trying to lead industry. During this period, the first major reorganization of the school system took place in 1900, with a major feature being the Vocational School Act of 1899 which established the legitimate needs for, and the building of, formal vocational schools run by the government of that day. The vocational school attained a distinct place within the school system.

> Many of them were established in the early years of the Meiji Era for the purpose of training middle-class technicians. They set out at first in the form of "training institutes" and gradually developed into full-fledged schools. (Aso and Amano, 1972, p. 27)

The success of industrial expansion increased the demand for skilled manpower and consequently the demand for vocational education. The ratio of applicants to actual enrollment increased from 1.9 times in 1912 to 2.6 times in 1920. The 1921-1924 period was a time of expansion, and a new appreciation for vocational and technical education in Japan. This culminated in a reform of the educational programs in 1931 with increased government subsidies, encouragement of supplementary vocational education (night and correspondence courses), close cooperation with businesses, promotion of "moral education" (that is, citizenship training), improvement of the administrative function, relaxation of some school

regulations (particularly certification regulations), and better treatment of teachers and other personnel.

Meanwhile, in 1924 the Education Ministry proclaimed that "the scholastic level of vocational school graduates could now be considered equal to or higher than that of middle school graduates". (Aso and Amano, 1972, p. 39) This improvement in educational standards led to an increased demand from industry for skilled workers, which in turn led to a large increase in the establishment of small private vocational schools and factory-run vocational schools. The relationship between education and the economy caused a growing demand for education amongst the middle class after World War I, which in turn promoted the expansion of the secondary and higher educational programs. This demand continued into the early Showa era (1925 - present).

The Showa era, beginning in 1925 was a period of extensive changes and upheaval in Japan. The world-wide depression which started with the New York stock crash in 1929 spread rapidly, to affect most of the world's economy. Japan was particularly hard hit by the middle of 1931. The exceptional expansion of Japan's economy and labor force during and after World War I was so recent that Japan's competitive level was weak, compared to other industrialized nations. However, educational programs expanded throughout the depression, in spite of financial

and social problems caused by the underemployment and/or unemployment of graduates.

1930 REFORMS

Major reforms in the school regulations were introduced in 1930. These were:

1. Two year vocational programs, to replace the three to five years programs following primary school and the two to three year programs following high primary school. This change was made to promote greater numbers of vocational schools with shorter school terms.
2. Curriculum changes to include civic studies and military sports (judo and fencing) as well as additional vocational subjects were approved.
3. Lower grade vocational excercises for students were added.
4. Night school programs for technology and commerce were expanded to include agricultural schools.
5. Guidance institutions and one year agricultural post-graduate courses in technology and fisheries were introduced.
6. The opening of "Youth Schools". These Youth Schools were supplementary vocational schools and had been started in a small way in 1893. While the original purpose had been to ease the passage of students into the world of work, by 1935 they

had become more military in character than vocational. (Japan National Commission, 1966, p. 168-169)

PRIVATE SCHOOLS

During the period from 1885 to 1935, a parallel development in training and employment practices took place. This was the development of the privately run, company-owned school, complete eventually with the life-long employment of suitable graduates. An excellent example of this development is provided by the Yawata Steel Mills.

Construction of Yawata began in 1897, on the northern coast of Kyushu, just west of the present city of Kita Kyushu. It began operations in 1901. Although public education expanded rapidly after 1890, vocational education tended to lag, causing shortages of skilled workers (oyabun). The demand for skilled labor in the steel industry expanded greatly in the period 1900-1910 with large numbers of smaller steel mills opening in various parts of Japan. These new mills depended on Yawata for raw material and technical help while serving various manufacturers with semi-finished goods. For example the Sumitomo, Kobe, Nippon Steel and Kawasaki Shipbuilding companies would receive pig iron and semi-finished plate from Yawata. They would then roll and heat-treat this raw stock into specified sizes and

metallic specifiations such as alloying, high or low carbon content, and so on, and fill the requirements of government arsenals, shipbuilders, railway equipment manufacturers and civilian products manfacturers.

This drastic expansion in steel-making meant that the industry suffered from severe shortages of capital, equipment, raw materials and skilled labor.

> The supplies of skilled workers required were quickly exhausted - as indicated by the considerable movement of these workmen from plant to plant, arrangements among the mills for sharing the skilled workers, and frequent attempts at labor piracy. These conditions, as in ship-building, starkly dramatized the need to organize the labor market and to systemize direct management of work forces within the new, expanding enterprises." (Levine and Kawada, 1980, p. 160)

The Japanese realized that a rationalization of labor supplies was needed in order to assume a stable, reliable source of skilled labor and to end the inter-company "raiding" practices of personnel recruiters. As Levine and Kawada note:

> With Yawata as the keystone, accounting for 70 to 80 percent of Japan's total steel production in these years, an intermeshing arrangement was developed whereby first Yawata and the military arsenals provided technical advice and lent skilled manpower to the private firms, especially to assure the dovetailing of production schedules to meet the government orders for materials. More important for long-run labor needs was the establishment of a formal training school for young craftsmen ("shokko yoseijo") within Yawata to serve as a model for the remainder of the steel industry and other metal-working manufacturing. It was hoped that the new direct training approach would not only turn out more productive employees, but also become

> the source for skilled workers and supervisors throughout the industry. (Levine and Kawada, 1980, p. 159-160)

The first classes were formally organized in 1910 and began training in 1911 with 66 employees. Yawata's in-factory training scheme was viewed as one part of a new multi-track educational system in Japanese secondary education. The new school was a two year program that drew trainees from a pool of young laborers who were graduates of higher elementary school. Most were 14 to 17 years of age. Training was a mix of classroom and on the job instruction with instructors being either experienced craftsmen or foreign experts.

The class of 1912 was comprised of 100 trainees and the numbers of trainees each year after 1912 gradually increased. By 1920, the Yawata employment system became a closed entity with about 20 percent of the employees having attended the company training school. Yawata no longer hired independent craftsmen, so that permanent employees were now hired only through company recruitment of school-age candidates.

Yawata Steel represented a drastic evolution from the informal and mobile labor market in Japan's work force 20 years earlier. The most important quality now was considered to be the early and continuous employment of workers from an early age. While the company school was important, the academic levels of skilled workers were not

very high with less than one third of production workers having progressed beyond sixth grade in ordinary schools. The Yawata training patterns spread to other steel industries. Mitsui Shipbuilding, a large customer for Yawata Steel instituted a closed hiring system and a training program, while Kobe Steel established similar schools in 1912. These programs tended to focus on the expertise and requirements of the industries affected, hence the trainees received specialized training not available to public school vocational trainees. Because of the specialized skills required in many of these industries, students who had taken vocational training in the public school were considered to be "hardly of more use to a given company than youngsters just out of elementary grades". (Levine and Kawada, 1980, p. 164)

Coincidentally, during the 1920's a radical labor movement arose, causing a series of labor disruptions. The government and the management sector of modern industry was quite hostile to the union movement, so the growth of company-based unions was promoted as a counter to the radicals. These company unions, together with management emphasized "Japanese-style" labor relations that promoted loyalty to the employer and harmony within the workplace. Increased emphasis was placed on the hiring of unsophisticated youths who could then be moulded into loyal employees, expected to perform

harmoniously within the organization.

> This meant a lessening of dependence upon the established oyakata (craftsmen), informal on-the-job training, and outside educational institutions. Within this context, in turn, arose the systematic schemes for wage payments and welfare benefits tied to the length-of-service for those workers who would become permanent employees of a given firm through its established proceedures. (Levine and Kawada, 1980, p. 164)

In 1931, following the Manchurian incidents, Japan acquired a stable source of coal and iron ore in Manchuria. This resulted in the merger of Yawata and six other private steel companies into the giant government-owned Japan Iron and Steel Company in 1933.

> This merger and expansion assured Japan of a fully-integrated steel-making operation with increased efficiency and production control for meeting military requirements. Yawata's training program turned out workers skilled in Yawata's technology on an inter-enterprise basis which facilitated the transition. By 1935, Japan Iron and Steel employed a total work force of 18,000 with an average length of service of 11 years. Hardly 2,300 had graduated from middle school or higher, even counting the advanced formal training at Yawata. The great bulk of workers had thus not gone beyond the sixth grade of elementary education, from which most had been directly recruited, trained and then held within Yawata. (Levine and Kawada, 1980, p. 165)

Yawata followed a program of continual refinement and improvement of the in-house educational system run by Yawata for both Yawata's and the other steel companies' benefit. By 1930, the program had expanded to a three year curriculum. The program was equivalent to the government-run Senmon Koho Gakko or technical college

without the educational prerequisites required for entrance into the technical courses.

The subjects covered included coking (concentration of coal for metalurgical work); furnace operation; civil, electrical, chemical and mechanical engineering; pig iron casting; rolling mill; and steel making. Advanced training on a semi-professional level was offered in highly specialized areas of study to promising members of the permanent work force. Admittance to the advanced programs was also limited to those with three years work experience and graduation from a middle school or seven years of employment if the student had not progressed beyond elementary school. An age limit of forty was imposed on first year applicants. While the private school was apparently satisfactory in the quality and quantity of students processed, a new training establishment was introduced during the mid-1930's. This new "Youth School" was established at the request of the government and was charged with the indoctrination and upgrading of the young members of the labor force.

In accordance with the military obligations of all young Japanese of the period 1880 - 1945,

> ...each young worker was required to take a five year combination of military and industrial training from the time he was initially hired. By 1939 about 5,000 workers at Japan Iron and Steel had received this training. The Youth School served especially as the means not only for improving the general quality of the new workers but also for meeting on-the-spot skill

> shortages - again, in line with the governments' new "emergency" policies for mobilizing manpower and controlling labor market mobility. In connection with the Youth School, the company also upgraded the technicians' training program by requiring all workers between 14 and 19 years old to take a special two year sequence in steel making and electrical work. Eventually more than 2,500 young workers completed this program. Also, experienced employees up to the age of 35 were required to enter newly established two year middle level and six month advanced level technical courses. Some 1600 workers went through these programs. As a result, by 1935 more than 10,000 employees of Japan Iron and Steel had received some formal training within the company, while 3,500 had graduated from the technicians school or had been enrolled in special advanced technical courses. A full-time instructional staff of 15 persons was maintained and supplemented with 15 part-time instructors. (Levine and Kawada, 1980, p. 167-168)

By 1941, training programs had become large enough to be organized as a separate arm of the company. When Japan entered World War II, a new engineering and technical school was established for high level specialist training. Graduates became engineering assistants for the professional engineers employed by Japan Iron and Steel. About 600 workers graduated from this program by 1945, and attained the same educational levels as secondary and college graduates from the public school system.

Yawata was only one example of these programs. Other industries such as Mitsubishi Shipbuilding in Nagasaki and Kobe, the Kawasaki Shipbuilding Company, the Hokkaido Mining and Shipping Company the Toyo Kongyo Company in Hiroshima (today the Mazda Auto Co.) established similar histories and training programs. Mitsubishi for example,

opened a high level craftsman's school in Kobe in 1919 to serve all of the shipyards under Mitsubishi's control.

The Toyobo or Toyo Cotton Textile Company established systematic and rigorous training programs for female workers in the textile mills, although the training was more of a technical nature than the militaristic Youth School training required from the male members of the work force. After World War II, the textile industry recovered rapidly, due largely to the skilled workers available to the industry during reconstruction. The same comment applies also to the steel and shipbuilding industries in that:

> ...despite the near destruction of both industries by 1945, each was able to re-establish its enterprise-based work forces relatively quickly once recovery got under way. The large groups of trained labor already attached to each enterprise were rapidly reassembled as if they had never been dispersed, especially with the prospect of permanent employment for almost all, now backed up by labor unionism. This process of drawing already trained workers to the new yards and mills undoubledly figured heavily in the rapid resuscitation of these industries, which became a key factor in Japan's "miraculous" economic growth after the mid - 1950's. With the re-establishment of the work forces, moreover, the enterprises also revived their long-standing internal training programs, albeit now without an emphasis upon ultra-nationalistic indoctination. Yawatas' "kyushusho" or training centre for example, was reorganized, upgraded in subject matter, and officially registered under the new education law as a "miscellaneous" school in the "quasi-seconday category." (Levine and Kawada, 1980, p. 174)

While the growth of the large, privately owned organizations was an important factor in Japan's industrial development, another key component of Japan's growth was the transportation system.

## JAPAN NATIONAL RAILROADS SCHOOLS

Initially, the Japanese islands were almost completely dependent on water transportation for trade and communications throughout the country. To a degree, this is still the situation, with both freight and passenger traffic being moved from one point to another on the sea-coasts in low and high speed (hydrofoil) ships. The other major passenger and freight movers are the railways, with highway traffic, although heavy, still moving only a small proportion of people and goods within Japan.

The railways were, and continue to be, vital to Japan's industrial growth, and were envisioned as such as early as 1860. The railway system in Japan is a mix of private and publicly owned railways, with continual efforts to upgrade and improve service being an ongoing part of their history.

The publicly owned Japan National Railroads, while owned and operated by the government from 1906, was run very much like a privately owned organization. The function of the railway was defined as serving national interests insofar as industry and the population were concerned, but was run like a private sector corporation

in areas such as profitability of the services, competitive procurement procedures for equipment, a patron-client relationship with its' employees, and a company-run training program. The first schools were started in 1872 to train telegraph operators in Tokyo. These became the basis for the first comprehensive railroad school set up in Osaka in 1877. Subjects covered included mathematics, drafting, general transportation, mechanical and civil engineering, and land surveying.

By 1910 the National Railroad had created a centralized school which, in addition to the previous subjects, included electrical engineering, English language, station administration, rail and locomotive maintainance, locomotive production and other local administrative problem-solving.

Beginning in 1921, scholarships were offered in public schools for promising recruits for the National Railroad for life-long employment. During the 1920's the practice of group discussion and group problem-solving became institutionalized within the railway systems. Aptitude testing was begun within the National Railway system, as were time and motion studies, safety programs and pay incentive systems in the 1920's and 1930's.

The takeover by the Transportation Ministry of the National Railway system left the functioning of the railways, including training, completely intact in order

to make the best use of skilled manpower during the war. Later, under the Allied Occupation, both the railways and related schools were left unchanged, except where some semblance of military training might have survived. (Levine and Kawada, 1980, p. 200-202)

The general pattern then, of private or industry-run training schools was much the same, whether the industry was privately run (Mitsubishi), originally private and then merged into a government supervised organization (Japan Iron and Steel, originally Yawata) or a purely government-run organization (Japan National Railroads).

## PUBLIC INDUSTRIAL EDUCATION FROM 1930 - 1945

The Japanese economy had managed a modest recovery from the worldwide economic depression by 1935. Exports of finished goods had reached almost double the 1920 level by 1935, although at the cost of driving the wage level downward, with a consequent lowering of the standard of living of the general population.

Other nations reacted by raising tariff barriers against Japanese goods, which in turn aggravated international tensions.

The Sino-Japanese war began in 1937 causing the militarization of the entire country. Production of many durable goods increased at a considerable rate, though this increase was mainly in the area of military procurement contracts.

In line with the needs of the military, a rapid expansion of the chemical and heavy industries took place with a consequent shift in the labor force from agriculture to these new industries. In turn, students graduating from primary and middle schools gravitated away from agriculture and towards the chemical and heavy industries.

These changes in industrial requirements led to the formation of a Council on Education in 1937 which functioned until 1941. This Council on Education made the following changes in secondary vocational education:

1. Different levels of secondary education made uniform.
2. New courses introduced including civic studies, science, mathematics, physical training, foreign languages and military training.
3. Attendance period shortened to four years.
4. Night school adopted for secondary schools.

The role of vocational education was redefined in nationalistic terms as follows:

> ...to clarify the mission of the Imperial nation in Eastern Asia and the world as a whole to become aware of the importance of Imperial industry, and to cultivate practical completion of ones' duties to guard and maintain the prosperity of our Imperial Throne. (Japanese National Commission, 1966, p. 178)

During the period 1937 - 1945, vocational education was given a new status and was changed from labor training to the status of a skilled academic, according to Imperial Principles. The purpose was to adjust the school system

to the military regime by standardizing schools and uniting them under a common idealogy. This common idealogy is summed up by Aso and Amano as:

> One of the guiding principles of the wartime education system was, needless to say, the trinity of Shintoism, government and education. The "moral principles of the Japanese Empire" signified the "whole of the cream of the national policy and the duty of the loyal subjects." That is, loyalty to the Emperor as "Personal God" as well as to the State was established as the basis of education in all stages of schooling. (Aso and Amano, 1972, p. 51)

In addition to the public and private vocational schools, the Japanese army, navy and air force offered apprenticeship courses to those personnel in the technical branches of the armed forces. These included motor and mechanical courses, electrical and welding, as well as civil engineering and construction trades. Where the personnel used public school facilities, the armed forces paid for their tuituion and the educational materials used.

The Handbook on Japanese Military Forces of October 1, 1944 states that:

> An Army apprentice system to procure non-commissioned offices in technical fields at ages below the conscription minimum has grown rapidly in recent years, especially in aviation. The Japanese Navy and Merchant Marine have also developed extensive training of a similar nature. The Army apprentices, are primary school graduates who begin their apprentice training at the age of 14 or 15 years. They spend 2 years at one of these special schools, the last year as youth soldiers in the Army. (Handbook on Japanese Military Forces, 1944, p. 5)

This program was also used to obtain officers for the technical services and "most of them have been chosen beforehand and had their education paid for by the Army. The Army schools are designed to supplement the technical training obtained in civilian institutions, and to adapt that knowledge to military purpose." (Handbook on Japanese Military Forces, 1944, p. 7)

During the period 1941 - 1945, the technical schools and college became even more specialized, with heavy emphasis on chemical and heavy industries with subjects further divided into specialized areas of study. A breakdown of subjects offered by techincal colleges in 1944 is given on the next page.

## INDUSTRIAL EDUCATION IN THE POSTWAR EDUCATION SYSTEM

The loss of the Pacific War by Japan and the subsequent occupation of the Japanese mainland by the United States led to an overhaul of the education system of a magnitude similar to that of the Meiji reforms.

Under the occupation, the Supreme Command as represented by General Douglas MacArthur assumed a level of power similar to that of the Shogunate in Pre-Meiji Japan.

| SUBJECTS | STUDENTS |
|---|---|
| Machinery | 4520 |
| Electrial Engineering | 1882 |
| Chemical Industry | 1381 |
| Mining | 670 |
| Architecture | 670 |
| Metallary | 475 |
| Aircraft | 475 |
| Metal Industry | 400 |
| Shipbuilding | 360 |
| Mining Machinery | 220 |
| Motors | 160 |
| Chemical Machinery | 160 |
| Electrical Chemistry | 115 |
| Ceramics | 110 |
| Fuel | 100 |
| Ship Machinery | 80 |
| Weapons | 80 |
| Oil Extraction | 80 |
| Steel Manufacturing | 40 |
| Pharmacy | 40 |
| Gunpowder | 40 |
| Ore Prospecting | 40 |
| Miscellaneous* | 150 |

*photographic, dyeing, printing, timber and fermentation industries

(Japan National Commission, 1966, p. 181)

The de-militarization of Japan was considered to be a top priority, as was the breaking down of the old class system and the institution of democratic ideals. Of equal importance a major priority was the rebuilding of the shattered Japanese industrial economy.

> In accordance with this policy, Supreme Commander Douglas MacArthur, in October 1945, directed the newly organized Shidehara Cabinet to undertake the following major reforms:
>
> (1) emmancipation of women
> (2) encouragement of the formation of labor unions
> (3) liberalization of education
> (4) abolition of secret police
> (5) democratization of the economic system
>
> Drastic changes followed, one after another. In October 1945, communists and other radicals were released from jail. In December, Shinto was deprived of its financial support from the government. During the same month the very progressive Trade Union Law, based on the Wagner Act was enacted and the zaibatsu (giant trading companies) were ordered disolved because they had been responsible for promoting the war. In January 1946 ultranationalist bodies were abolished and undesirable individuals were purged from public service.
>
> During this early period the Americans greatly altered and influenced the basic characteristics of the Japanese political and social system. The traditional society of the nation offered little resistance, as the Japanese people again were obedient to authority. (Okochi, Karsh and Levine, 1974 p. 49 & 50)

Conditions in Japan were in a bad way with food and housing in short supply, transportation in chaos, the population apathetic and disillusioned and the education system under severe attack by the Occupation Authorities. The Japanese National Commission for the United Nations

Educational, Scientific and Cultural Organization

documents the situation as follows:

> The Japanese economy after the war was in a depressed state; industrial production was only 60-70% of prewar days, and national consumption was about 60% of the prewar level. Destruction of the value system and the established social order (based on prewar stadards) caused much confusion in the Japanese society, especially in the economy. However, in the midst of this chaos, efforts were made to create a new educational system, emphasizing democratic principles of education and providing everyone with an equal educational opportunity. The new educational system was created to meet political and social needs, rather than specific economic demands. (It can be viewed as analagous to the investment which preceeded economic development, which was made during the Meiji Restoration; or, that which took place between the Taisho and Showa Periods.) The new system was instituted to end the domination of secondary and higher education by the privliged class. As a result, the number of students proceeding to the new high schools grew rapidly, and many of them went on to universities.
>
> Under the postwar educational system, the position of industrial education was changed to conform to the 6-3-3-4 linear school system.
>
> A. The object of high schools under the new system was defined thus: "to give higher general education and vocational education according to the development of the body and soul upon the foundation obtained at secondary schools". (Article 41 of the School Education Law.)
>
> Regular and vocational courses are provided in high school education. The vocational course is further divided into divisons such as agriculture, technology, commerce, fishery, homemaking, merchant marine, and so forth. The high school curriculum has been so arranged as to correspond with the principles of co-education, and equal opportunity for education.
>
> Subjects are divided into generally required subjects and electives. Five subjects, that is Japanese, social studies, mathematics, science,

and physical education (which includes hygiene) are required for both courses. A unit system has been adopted in which 35 class hours count as 1 unit for every grade, and the required number of units for graduation is 85. Of the 85, 38 units must be obtained the general subjects. In the vocational course, more than 30 units from vocational subjects are mandatory. The new educational system has emphasized the necessity of comprehensive high school education; therefore, the number of purely vocational schools at the high school level has been reduced whereas the number of comprehensive high schools has markedly increased. As a result, the number of students wishing to enter vocational schools declined, and those entering the regular course increased.

Facilities for the vocational course were not sufficient and education in vocational schools was unsatisfactory. In 1951, the Industrial Education Promotion Law was passed in order to promote industrial education by giving financial aid.

B. Higher industrial education, which was offered at two levels under the prewar system (in universities and colleges), was to be offered only at the university level in the new system. Postwar university education was based on two considerations: first, that higher education before the war placed too great an emphasis on practices and did not provide adequate general education; and second, that prewar vocational and technical education by providing a weak academic foundation, limited its future development and application. Postwar university vocational education was designed to correct these previous mistakes. However, the actual level of industrial education under the new system was one year lower than of its predecessor, the department of technology of the Imperial universities. Moreover, under the new system, the vocational colleges, where middle grade engineers had been trained, were completely abolished. Instead, junior colleges offering two or three years of higher education were established. They became institutions of higher education mainly for special vocations. But these junior colleges were quite different from the old vocational colleges and were unable to provide adequate industrial

> education. Therefore, in order to satisfy the need for middle grade engineers, special technical high schools were inaugurated in 1962. They are open for middle school graduated and give five years of industrial education. (Japan National Commission, 1966, p. 185, 186, 187)

Although this survey is primarily directed at vocational education in Japan, the impact of the American occupation of Japan on the Japanese education system as a whole must be appreciated.

## GENERAL DOUGLAS MACARTHUR

To begin with, Japan's unconditional surrender in 1945, meant that the Japanese mainland was completely at the mercy of the occupying forces. This meant that Japan was obliged to accept whatever decisions and judgements that the occupation authorities handed down in every facet of life in Japan at that time. Having noted this situation,

> ...it is difficult to imagine a better choice of an individual (MacArthur) to have taken up the almost insuperable task of rebuilding Japan both morally and physically in order to create a stable nation tied politically and economically to the United States. MacArthur, as a latter-day Shogun was one of those fortunate accidents of history when the right man is chosen to do a job which, in retrospect, seemed destined for him from the beginning of his career. (MacArthur in Japan, 1973, p. 25)

Amongst MacArthur's objectives in Japan were measures which amounted to a near-total restructuring of Japanese society. The Emperor was stripped of his god-like status, at the insistence of the military government under

MacArthur, the country was completely demilitarized and the large trading companies were broken up (Japan Steel, Mitsui, Mitsubishi, etc.), land reform was undertaken wherein all large estates and landholdings were broken up into small parcels which were then sold to small farmers at very reasonable prices. Women were given the vote for the first time and the education programs were completely overhauled. The reform of educational programs was at least as important as all of the rest of the changes wrought in Japan's social fabric.

> MacArthur was deeply concerned about this aspect of Japanese life for a number of reasons. As an American, MacArthur believed that control over primary and secondary education should be in the hands of local authorities in order to preserve the regional character of education as well as to prevent dictation from an ideologically-oriented, distant capital. This practice was not common to Japan at any time in its recent history. A ministry of education purchased school books on a national basis, and of course during the war not only education, but press, radio films and theatres were under the control of a propaganda ministry. Nevertheless Japanese education... before the war...was among the best in the world.
>
> But it had a grave fault. It was designed, not so much for the improvement of the individual, but for the training of that individual in the service of the state, as well as society. Thus education was strictly controlled by the national government so that students of every variety were molded into one regimented, standardized mold, with origi-nality and initiative suffering as a result. Utilitarian studies, such as engineering and the physical sciences were stressed at the expense of literature and the arts. Dissatisfaction with the system was widespread among many Japanese educators even before the war, but when the teaching of Shinto propaganda became widespread immediately

before and during the war, their voices were silenced. Once defeat was grudgingly accepted, it was obvious that there was a groundswell of support for radical changes in Japan's educational system. However, there was great controversy about how it could be changed.

Soon after his arrival in Japan MacArthur suspended the teaching of geography, history, the martial sports and particularly "ethics", which was an important outlet for the dissemination of nationalist and Shinto-oriented propaganda. Meanwhile a US Education Mission composed of twenty-seven prominent American educators was sent to Japan under the leadership of Dr. George D. Stoddard, subsequently President of the University of Illinois. The commission spent only three weeks in Japan and then presented a report to General MacArthur. Few of the educators were familiar with Japan, but despite the hurried nature of their report, it was quite balanced and constructive in tone. It sug-gested a decentralization of Japan's educational system and its disperal among autonomous, locally elected education authorities on the American model. New text-books were quickly published to replace their nationalistic predecessors.

Many problems unforeseen by MacArthur soon appeared. Though it had been centralized, the Japanese education authority had been competent and professional. Many of these bureaucrats in Tokyo now found their authority usurped by petty officials on the local level who knew little and cared less for education as such. The restructuring of the school system into primary, junior high schools, high schools and universities on American lines was successful in that many more students had the opportunity to pursue their individual interest in formal educational institutions in adulthood. (MacArthur in Japan, 1973, p. 46, 47)

## EDUCATIONAL REFORM 1945 - 1946

This massive restructuring of the education system was undertaken on a scale similar to that of the Meiji

reforms of the 1880's, but with some very profound differences.

First, where the early reforms had been undertaken by Japanese administrators, albeit in response to pressures created by foreign influences (the need to compete with Western nations), the reforms of 1945 - 1946 were undertaken by foreign administrators largely in response to the desire by foreigners to restructure Japanese society.

Second, the imposition of the American single-track education system in place of the multi-track Japanese educational system was an attempt at full democratization of the schools with the ideal of opportunity for all and special priviledge for none of the new student body.

Third, the complete demilitarization of both Japanese society and the school system meant that a total overhaul of both the curriculum and textbooks from pre-war days had to be undertaken on an immediate-priority basis. This was in stark contrast to the Meiji and later eras of deliberately stressing military-style training and discipline within the schools.

Fourth, the early emphasis in Meiji Japan had been on vocational and technical education with a view towards the creation of a skilled work-force to build new industries and a rich industrialized Japan. The emphasis in 1945 - 1946 was more on the academic sector, with the idea that improved, democratic education would allow greater move-

ment of the individual within society with particular attention being paid towards the upward mobility of members of the lower or working classes.

Fifth, the welfare of the individual, as opposed to the welfare of the state, was emphasized with a consequent emphasis on the academic enrichment of the individual, rather than the material enrichment of the state.

Sixth, a strong movement towards decentralization of the school system was undertaken with the aim of making local school boards and prefectures responsible for the curriculum and textbooks used by students. The avowed motive was to prevent the future propagandizing and consequent militarization of the school system.

As a part of this effort, a new Imperial Rescript was promulgated which renounced the deification of the Emperor and redefined his role as a constitutional monarch along the lines of the British Crown. (See Appendix II for original Rescript.)

The question that arises immediately is, given the conservative nature of many senior officials in governments anywhere, were these proposed reforms in fact adopted? The answer was somewhat equivocal in the opinion of Robert King Hall. Writing in EDUCATION FOR A NEW JAPAN, Hall noted that: "It may be advanced that the 1947 Reform postulates a decentralization of power. Evidence to date would indicate that the Japanese have paid lip

service to a popular policy of the foreign advisors, while retaining almost intact the basic powers and controls of the Ministry." (Hall, 1949, p. 289, 290)

The methods of central control, once established have been highly effective, although not always done in an overt, authoritarian manner. Hall also noted that:

> The Japanese Ministry of Education has controlled the educational system through five direct techniques: it has written the basic laws and orders; it has directed the administration and supervision, including school inspection; it has exercised basic administrative control over the finances; it has maintained a monopoly in the eudational services such as radio, film, textbooks, recordings, special teaching institutes, and research; and it has directed the punitive and restrictive measures of Thought Control. It may be protested that this last is an outmoded and illegal procedure but it is evident that the power to license and to "screen" the teachers, the uncontested right to determine curricula and to censore teaching materials, and the sole authority to admit, exclude, promote, and discipline students would give essentially the same control if abused.
>
> But are there not other indirect techniques of control which are equally powerful and equally susceptible to the manipulation of a powerful and unscrupulous minority? Three are readily discernible: tradition, ignornace, and prestige.
>
> Tradition is an integral part of the educational thought of Japan. The...Shinto ritual and... Confucian philosophy has placed a reverence for the past and a respect for the thoughts and actions of ancestors on the highest moral plane....
>
> Ignorance is the powerful weapon of any police state or authoritarian government. The masses of people must be kept docile through ignorance of the true facts if they are to remain submissive to the manipulations of a ruling clique. This...is likely to continue to be true, no matter what type of national administration

> comes to Japan, if the entrenched bureacracy in the Ministry of Education, retains its hold on the government services.
>
> Prestige is an intangible but effective control. The Ministry of Education has suffered the most intensive and sustained attack of its history. But evident through almost all the caustic criticism and violent denunciation of the Ministry has been an acceptance of the commanding position of that organ. The Ministry still has the power to influence the thinking of the vast majority of Japanese educators....There may be vocal disagreement with enunciated policy of the Ministry, but whatever that policy may be it is respected. (Hall, 1949, p. 288, 289)

From Hall's comments, plus the continuence of some of the more conservative practices in the Japanese school system, it should not be a surprise that while some aspects of Japanese technology have been innovative and highly effective, still Japan does so, not because of but in spite of some aspects of her education system.

In the matter of textbooks and curricula, the immediate post-war period was one of chaos with buildings, printing presses, paper and school facilities in very short supply. The result was a short period of confusion until new texts and curriculum could be printed, schools reestablished in those buildings still intact and teachers screened for competence and militaristic histories. The subject of texts and curriculum caused a considerable debate to occur between conservative elements amongst the Japanese educators and the Occupation Authorities, and the more liberal members of the Japanese and Occupation

Authorities. This debate centered around the difficulties of both teaching and learning the Chinese-style Kanji alphabets as compared with the relatively simple Katakana (phonetic) Japanese alphabet or the adaptation of the Roman alphabet to Japanese (Romanji). As a result of this debate, a report was written and submitted to General MacArthur in 1946, headed by Professor George S. Counts of Columbia University, which recommended amongst other measure that:

> ...in time Kanji should be wholly abandoned in the popular written language and that a phonetic system should be adopted.
>
> In the judgement of the Mission, there are more advantages to Romanji than to Hiragana and to Kata Kana.
>
> We propose:
>
> 1. That some form of Romanji be brought into comman use by all means possible.
>
> 2. That the particular form of Romanji chosen be decided upon by a commission of Japanese scholars, educational leaders and statesmen.
>
> 3. That the commission assume the responsibility for coordinating the program of language reform during the transitional stages.
>
> 4. That the commission formulate a plan and a program for introducing Romanji into the schools and into the life of the community and nation through newspapers, periodicals, books and other writings.
>
> 5. That the commission study, also the means of bringing about a more democratic from of the spoken language.
>
> 6. That in view of the study drain on the learn-time of children, the commission be formed promptly.... (Hall, 1949, p. 357, 358)

The Policy for Revision of the Japanese Education System was published on March 27, 1947, and approved by the Occupation Authorities. Many other recommendations were approved and adopted, not the least of which was the shift to the open, linear, American-style education system comprising six years of primary, three years of middle school and three years of upper or senior school (The 6-3-3 system). Regretably, from the students' viewpoint, not one of the above recommendations on the removal of the time-consuming Kanji alphabet is in use today, with what many educators perceive as an unacceptable time load required to achieve the necessary expertise in what many consider to be an obsolete form of communication. (Hall, 1949, p.308, 309)

With respect to vocational training, the pre-war (1937) situation had been quite comprehensive. Five types of vocational schools (sometimes called "special schools") had been established. These included agricultural schools (Nogyo Gakko) commerical schools (shogyo gakko), fisheries schools (suisan gakko), industrial schools (kogyo gakko) and trade or vocational schools (shogyo gakko). In 1937, Japan had established 1,355 vocational schools, employing 20,879 teachers and serving 447,449 students per year. (Hall, 1949, p. 244)

There is no reason to believe that these same schools did not continue to exist after 1945, subject to war

damage and human casualties. The relative excellence of the training programs plus their very numbers added greatly to Japan's ability to recover from the losses sustained in World War II. However, under the Educational Reform Act of 1947, the senmon gakko or technical schools were abolished, leaving the public vocational schools and the private vocational schools to produce the required skilled workers.

The excellence of these programs meant that in the period 1945 to 1951, the only changes from pre-war public and private vocational schools lay in the afore-mentioned areas of demilitarization, social restructuring and the adoption of the linear school system. The vocational schools were viewed as being satisfactory in their functions; therefore full attention to change was focused on the academic structure and curriculum. Consequently, the industrial schools (kogyo gakko) and the trade or vocational schools (shogyo gakko) in both public vocational programs and privately - run company schools survived the post-war period with their programs more or less intact, unlike the senmon gakko which were phased out in 1947 at the direction of the occupation authorities.

The higher vocational schools in pre-war Japan were polytechnical institutes or colleges called senmon gakko.

> The Japanese college or technical institute was a three to five-year school offering course loads of a definitely higher level than secondary institutions, frequently of better academic

> quality than the higher schools, yet not accorded quite the recognition given university work. Students were admitted upon graduation from the boy's middle school or by a very severe competitive examination if they did not hold that diploma. As the name indicates, they were "specialty" schools offering intensive work in one or more technical specialties and in the arts and sciences. In 1937 there were 213 of these schools (140 of them private), with 9,763 teachers and 121,280 students. They constituted the source of a very large percentage of skilled technicans upon which the Japanese industrial and commerical structure was based. (Hall, 1949, p. 246)

The abolition of the senmon gakko in 1947 created a gap in the system. The higher technical schooling was now supposed to be taught in the universities while the lower technical courses were to be taught in the public and private schools. The Japanese were never very satisfied with this structure due to the lack of middle level technical training and moved in 1962 to reestablish the senmon gakko to remedy this shortage of middle level technicians.

As Japan struggled back to normalcy following World War II, the budget for education was somewhat limited given the demands on the treasury for funds to aid construction, feed the population and rebuild the transportation system. The 1946 Japanese national budget allocated a total of 1.22 per cent of the total budget for education. By 1948, these figures had risen to 3.77 per cent of the national budget, reflecting the commitment to education felt by the government of that day.

The Japanese economy had recovered by 1951 with the gross national product surpassing pre-war levels. This production performance has continued with a number of new records in production set in spite of some rather severe economic jolts such as the "oil shock" of 1975.

## INDUSTRIAL EDUCATION PROMOTION LAW

This growth has been largely achieved due to the industriousness and technical expertise of the Japanese population. In order to sustain and improve this technical expertise the Industrial Education Promotion Law was passed by the government in 1951. This law aimed at the upgrading and improvement of existing programs, mainly by providing for the injection of new funds into these facilities. Under the Industrial Education Promotion Law, a system of equalizing opportunities for youth was established by building Public Vocational Centres in eastern prefectures in Japan. By 1952, Japan had built 272 of these public facilities and were training 32,000 students in them. (Japan National Commission, 1966, p. 214)

## 1958 VOCATIONAL TRAINING LAW

As Japan's economy continued to expand, the demand for skilled labor increased. In 1958, the Vocational Training Law was passed, which amalagamated the various elements, both public and private in the vocational training system. A new Skill Authentication System was

introduced in concert with the Vocational Trianing Law to provide a uniform, positive training program to produce skilled workers to a consistent standard.

Previous to the passage of this law, the public schools had been entrusted with a relatively disorganized and feeble pre-vocational program. The coordination of public school courses with projected public or private vocational schools was at best, spotty. This new Vocational Training Law of 1958 represented an attempt at a comprehensive, long-range integration of skills, training and the anticipated labor market. Thus, a student graduating from primary or middle school would presumably have attained an introduction into whatever field of endeavor he intended to enter. If he intended to enroll in a public vocational school or in a private enterprise school, he would have received the preliminary education required for successful competion of his vocational courses. The government standards were laid down with a view, not only to ensuring that students reached certain skill levels, but also received further academic education, to assist the student in becoming a better educated individual. The Japanese National Commission of 1966 notes that:

> The duration of enterprise vocational training is three years and mutual authentication between the enterprise training and higher secondary schools has been granted. Some of the training centres offer curricula that are related to part-time secondary schools and correspondence

> courses. This connection of the training of skilled workers, as a part of the labor policy, and the higher secondary education has been a growing tendency in Japanese industry. (Japanese National Commission, 1966, p. 214)

One of the major objectives in the 1958 program involved the vocational training and retraining of adult workers to fill skilled labor vacancies during the boom years of the late 1950's and early 1960's. This also included training and retraining of unemployed, older and handicapped workers. The Skills Authentication System certified students in eight different categories. These were administered, however, by the Ministry of Labor rather than the Ministry of Education, which caused some discontinuity in the administration of the vocational education system when the student applied for skills certification. In any case, the most popular vocational training facilities have been the private company schools, due to the Japanese practice of life-long hiring and training of new personnel in both small and large enterprises. The private or enterprise vocational schools, offering training that is approved by the Ministry of Labor offer courses in their particular specialties (ie metals) up to and including Junior College level.

About 80 percent of the total number of students were enrolled into the industrial or service occupation fields with the most popular being industrial chemistry,

electricity, civil engineering, machine shop practice and architecture.

The following tables list the courses available at technical schools in 1954:

Specialization of Agricultural and Fisheries Courses, 1954 (fixed number)

Courses related to Agriculture

| | |
|---|---|
| Agriculture | 55,380 |
| Horticulture | 2,223 |
| Livestock | 2,758 |
| Sericulture | 516 |
| Agricultural Products Processing | 1,163 |
| Forestry | 3,618 |
| Agricultural Civil Engineering | 2,483 |
| Farming Households | 5,814 |
| Agricultural Forestry | 751 |
| Landscaping | 40 |
| Agrarian Sericulture | 680 |
| Others | 505 |
| Total | 75,931 |

Courses Related to Fisheries

| | |
|---|---|
| Fishery | 1,560 |
| Sea Products Processing | 1,574 |
| Marine Life | 314 |
| Marine Product | 540 |
| Fishery Management | 165 |
| Fishing Boat Engineering | 125 |
| Others | 205 |
| Total | 4,484 |

Specialization of Technical Courses, 1954 (fixed number)

| Subject | Number of Students |
|---|---|
| Mechanics | 25,705 |
| Automobiles | 295 |
| Electric Power | 14,516 |
| Electric Communication | 2,937 |
| Architecture | 7,725 |
| Civil Engineering | 5,579 |
| Wood | 2,479 |
| Metal | 815 |
| Technical Chemistry | 6,715 |
| Dyeing | 738 |
| Spinning and Weaving | 2,090 |
| Shipbuilding | 628 |
| Ceramics | 680 |
| Mining | 1,130 |
| Machine Electronics | 330 |
| Civil Engineering, Architecture | 445 |
| Weaving and Dyeing | 690 |
| Metallurgy | 190 |
| Mining and Metallury | 210 |
| Design | 463 |
| Printing | 267 |
| Painting | 122 |
| Textiles | 185 |
| Food Technology | 80 |
| Railway Engineering | 350 |
| Tele-communication | 280 |
| Others | 1,501 |
| Total | 77,185 |

(Japanese National Commission, 1966, p. 188)

The curriculum used required 85 units of study for high school graduation. Of the 85 units, 38 units were required subjects that were universally used in all of the high school courses, no matter what their specialty. That left 30 units which were related or specific to the specialized field chosen and 17 units as elective courses. The English language courses were not included in the regular courses so usually ended up inserted into the 17 unit electives area.

Technical Subjects and Units 1949

| Subjects | Units |
|---|---|
| Practice in Machinery | 10~37 |
| Practice in Electronics | 10~37 |
| Practice in Chemistry | 10~37 |
| Practice in Spinning and Weaving | 10~37 |
| Practice in Woodcraft | 10~37 |
| Drafting | 2~20 |
| Electromagnetic | 3~10 |
| Applied Chemistry | 2~10 |
| Technical Chemistry | 3~15 |
| Materials | 2~10 |
| Mineral and Geology | 3~ 5 |
| Mining | 2~15 |
| Ore Processing | 2~10 |
| Metallury | 2~15 |
| Furnace Fuel | 2~10 |
| Planning | 3~10 |
| Drawing | 3~10 |
| Civil Engineering | 3~15 |
| Architecture | 3~ 5 |
| Structure | 3~10 |
| Woodcraft | 3~15 |
| Metalcraft | 3~15 |
| Design | 3~15 |

| Subjects | Units |
|---|---|
| Machinery | 2~15 |
| Marinecraft | 5~15 |
| Spinning and Weaving | 3~15 |
| Dyeing | 3~15 |
| Weaving | 5~15 |
| Ceramics | 3~15 |
| Printing | 3~15 |
| Marine Equipment | 3~ 5 |
| Chemical Instruments | 2~10 |
| Electrical Instruments | 3~15 |
| Communication Instruments | 3~15 |
| Electricity | 3~15 |
| Tele-communication | 3~15 |
| Motors | 3~15 |
| Machines | 2~15 |
| General Machinery | 2~ 5 |
| General Electricity | 2~ 5 |
| Plant Management | 2~10 |
| Mine Management | 2~ 5 |
| History of Technology | 2~ 5 |
| Laws Related to Technology | 2~ 5 |

A profound shift in educational direction occurred in vocational education after 1949, in that "In the old system, technical education was given a special position, distinct from regular education, that is to emphasize vocational training. But the objective of the new system was to train technicians who had both general and scientific knowledge, consequently the number of class hours for technical education in itself has been limited." (Japan National Commission, 1966, p. 190)

The above statement emphasized the very early commitment of the Japanese vocational education system towards producing graduates possessing a generalist rather than a specialist background.

## EMPLOYMENT PROMOTION PROJECT LAW

The 1958 act was followed by the Employment Promotion Project Law in 1961 which expanded the scope of public vocational training to include newly unemployed coal miners, dock workers and handicapped workers while in 1963 the public employment offices were included in the vocational training programs. Newly 400 short-term vocational training centres offering over 1,000 training programs were established under the 1958 act. Most of these schools were run in cooperation with large and small companies and were mainly concerned with the training or retraining of adults.

Two types of public vocational school were envisioned under these short-term adult training programs.

1. The prefectural governments set up general or "advanced" centres for training dispaced workers for periods of two months to a year and to offer a basic training course for new entrants to the labor force varying from six month to a year depending on the field of study.

2. The Employment Promotion Projects Corporation (a central government organization) set up comprehensive, advanced training centres offering specialized training directed at job instructor training and at workers displaced by new technology. In 1976, the system had 201 "general" centres with 130,000 students and 211 "advanced" centres with nearly 85,000 students.

The 1958 act, in supporting private in-plant training programs, specified that the scholastic standards would be set and approved by the Ministry of Labor.

"By 1974, more than 1,100 plants and groups received such authorizations and the number of trainees exceeded 73,000." (Levine and Kawada, 1980, p. 132) The basis for the 1958 act was in a real and pressing need for skilled labor. Japan percieved a situation developing in which vast numbers of skilled job openings had become available but with a pressing shortage of skilled workers to fill these positions. To the Japanese, the shift from primary

to secondary and tertiary industries meant a shift in skills levels from rudimentary to high level technology. This in turn meant the likelihood of an increasing number of low or unskilled workers joining unemployment lines at a time when the high-skill job market was expanding. Levine and Kawada note that: "At the time the 1958 Act was adopted, the Japanese government estimated that there were unfilled vacancies for 800,000 skilled workers or about 15 percent of the labor force. By 1965, this estimate was revised upward to a shortage of 1.8 million or 22 percent of the skilled labor force, and it remained at that level until 1970." (Levine and Kawada, 1980, p. 133)

These programs, while acutely aware of the needs of both Japanese industry and of the unemployed workers were not a uniform success. Levine and Kawada further note that:

> Despite these efforts, the Act of 1958 failed by far to reach its initially announced ten-year goals of training 1.55 million new skilled workers, upgrading 1.39 million experienced workers and refreshing 420,000 foremen. By the late 1960's only about one half of these targets had been achieved. Moreover those involved were primarily workers in small and medium firms. Very few new school graduates attended -- perhaps not more than 10 percent of the enrollees. As a result, the government turned to an even more active manpower policy. In 1966, it adopted the Employment Measures Law, which aimed at achieving full employment, matching labor supply and demand, and developing and utilizing every worker's potential abilities. The objective was to shift the role of the vocational training centres decisively

> from correcting ad hoc imbalances in the labor market to preparing workers for long-term careers. The "failure" of the 1958 act it appears, lay in the reluctance of junior and senior higher graduates to enter the vocational training schools (only about 10 percent did so) because they still did not perceive these schools as important channels for upward mobility and employment security compared to enterprise programs.
>
> The Japanese government, in a new approach to the employment problem enacted the Basic Employment Measures Plan in 1967. The 1966 Employment Measures Law was introduced with the 1967 Plan in an effort to break down the division of the labor market into enterprise and non-enterprise sectors. The avowed purpose was to increased job mobility with a view towards aiding the 15 year national development program of that day.
>
> By 1971, the 1958 act had been again revised into the National Vocational Training Plan. This revised plan proposed doubling or tripling the numbers of trainees and programs by the mid-1970's. Skill training, adult and youth training and emphasis on "life-long" training were stressed. The problems resulting from the "oil shock" of 1973 meant that Japan could no longer rely on an uninterrupted growth patterns. The economic slow downs of 1974 and 1975 prompted the government to enact the Employment Insurance Act of 1975, in which companies who retained workers on the payroll who would otherwise have been laid off or displaced were given government subsidies and/or tax advantages to pay for retaining workers on the payroll. (Levine and Kawada, 1980, p. 134)

SENMON GAKKO (POLYTECHNIC)

One of the more popular aspects of the vocational programs have been the polytechnic or "senmon gakko". These schools have been re-established since 1962 in each prefecture in Japan. They are locally controlled but are graded and accredited by Tokyo. These schools have as

their purpose, the education of middle grade engineers and technicians. Generally the "senmon gakko" operate on a "6-3-5" system which is an extension of the public school system. That is, six years primary, three years secondary and five years upper or senior schooling. These schools are designed to serve the needs of industry in recruiting middle level engineers and technicians while at the same time educating those students unable or unwilling to follow the academic route to university. The senmon gakko was first initiated in Japan in the 1890's and served as a supply training centre for middle level engineers and technicians until 1945. They were abolished in the Educational Reforms of 1947 but reintroduced by the Japanese government in 1962. The reestablishment of the senmon gakko was a response to a report submitted in 1954 by the Federation of Employers Association (Nikkeirin) in which:

> It criticised contemporary education for being incongruent with the demands of industry and reminded the Ministry of Education of the need for increased training in engineering and science at the college level and for the differentiation of higher education. It also proposed new technical schools: five year technical colleges fusing vocational high schools and two-year colleges and six-year vocational high schools composed of middle vocational high school training. The report characterized the technical colleges as crucial to training the middle-range experts and labor needed in industry. (Shimahara, 1978, p. 129-130)

Further pressure and reports followed in 1956 with concerns being expressed as to Japan's future competiveness in world trade. The governments reaction to these reports were (1) expansion of science and engineering and science, (2) revision of the appropriate curriculum for middle and high schools, (3) most importantly, after numerous delays, the polytechnics or senmon gakko were reestablished as higher technical schools (koto senmon gakko) in 1962. These koto senmon gakko were five-year schools with scholastic levels equivalent to three years high school and two years college. By 1963 the government had opened 24 of these schools and by 1973 had increased to 63 the number of senmon gakko in operation throughout Japan. (A course outline is provided in Appendix III to clarify the types of subjects covered in these junior colleges.) The number of technical colleges in Japan has decreased by 1 from 1973 to 62 of these colleges in 1979.

According to the STATISTICAL HANDBOOK OF JAPAN, 1980:

> The system of school education basically consists of four levels, elementary school (6 years), junior high school (3 years), senior high school (3 years) and university (4 years). There are three types of higher education organs - universities, junior colleges and technical colleges. Along with the standard education organs mentioned above, there are special training schools and miscellaneous schools, which have a vast variety of courses for vocational and practical training.
>
> In April, 1979, 94.0 percent of junior high school graduates entered senior high schools or technical colleges, while 32 percent of senior high schools graduates went on to universities

and junior colleges. (Statistical Handbook of Japan, 1980, p. 128, 129)

The senmon gakko continue to provide a ready means of training technicians and junior grade engineers, at the same time providing a means of continually raising the general education level of vocational students in Japan. For example, if a graduate of a senmon gakko wishes to, he may challenge the university entrance exams although not many students feel secure enough to do this. In any case, as the complexity of society and the tools used by society increases, the senmon gakko will serve a most useful function in raising the educational standards of students who are about to enter the work force.

Furthermore, the early committment to a generalist type of vocational education has allowed the Japanese vocational education system a great deal of flexibility in updating and changing education programs to meet both the present and projected future need of industrial Japan.

As Nobuo Shimahara concludes:

> The evolution of education in Japan clearly indicates that formal education is a function of political and economic institutions -- the thesis stated at the outset of this volume. While it may enhance personal interest in one way or another, its primary goals are to mold individuals so as to promote organizational impera-tives. For this purpose, Japanese are trained to be diligent, resilient, and con-vergent and to endure organizational pressures. They are a remarkably disciplined people. (Shimahara, 1979, p. 170)

## SUMMARY AND CONCLUSION

The development of Japan's vocational training programs and her education system were a direct reflection of her wish to maintain her independence through gaining a degree of economic, political and military parity with those leading Western powers of the late 1800's.

Starting with a very poor natural resource base, Japan at an early stage determined that the only way to attain the desired equality with the West was by exploiting the one resource with which she was abundently endowed: the intelligence and diligence of her population. To this end, Japan embarked on a program unique in the world, that of training technical staff ahead of the building of the projected industries.

The contributions of Arinari Mori, Japan's first real Minister of Education created an especially effective education system that stood the test of time intact for nearly 60 years. He was in fact, the architect of the so-called "Meiji reforms" which were in large part responsible for Japan's "great leap forward" from 1890 to 1945.

The growth of the privately run schools as an arm of some of the larger companies is a parrallel development which began to hit full stride in the 1920's. These private schools made an enormous contribution to the training, education and utilization of badly needed technical staff at a time when the supply of trained

personnel was critically short. The Yawata Steel Company example was chosen as a model for the rest of the heavy industry and chemical complex, because of its' leading position in Japanese industry and because Yawata is still in production today, as reported by Levine and Kawada.

The loss of World War II and the subsequent occupation of Japan by the American military practically guaranteed that many profound changes would take place within Japan's social system and therefore the education system. Significantly, the changes in the vocational system were minimal, due to the need for trained technicians.

Of further significance is the direction of the public vocational system towards producing generalist oriented graduates rather than specialists, as noted by the Japanese National Commission. The unions in Japan are relatively weak and the job-skill indentification of the Japanese worker is likewise ambivalent with a much stronger identication with the company being a feature of Japanese personal identification. The result is that it is much easier to for the Japanese worker to be a generalist because he feels no difficulty in shifting from one job skill to another within a company, than for a European or American who maintains a strong job-skill identification and a relatively weak company identification.

The post-war years have seen a number of adaptations in the vocational education system in order to meet skilled labor shortages. However, the two-track private and public systems, while exhibiting some problems due to the relatively short-term goals projected, have in fact performed well overall, with imaginative and progressive programs being introduced where necessary or useful.

The technical schools (senmon gakko) have served Japan well in spite of the interuption from 1945 to 1962 of their functions. The programs are useful and imaginative with most programs being very progressive in nature.

With reference to the private schools, (such as Yawata) the reader should clearly understand that while specialist courses are taught with the specific need of the affected industry in mind, the mobility of the worker within the company results in an individual receiving a generalist education consisting of specialist modules integrated into an overall production picture. This mobility of the worker, often across skills or trades associated lines, has certain positive benefits for both the enterprise and the worker.

For the company, it means the retention of valued, reliable workers, thoroughly familiar with the overall production organi-zation while retaining the freedom to install the latest in labor-saving and cost-cutting innovations without the threat of labor strife or disruptions.

For the worker it means the avoidance of assembly-line boredom, the threat of layoffs due to technological advances and a sense of financial stability that is becoming an ever more scarce commodity in Europe and North America. In addition, an ever-increasing emphasis is being laid upon higher academic achievements of the worker as a means of grasping ever more technical aspects of the working environment. An example might be found in the proliferation of computers and robotics in the Japanese industrial climate, and the consequent educational requirements for the individual worker to be able to utilize these new tools effectively.

# CHAPTER IV

The purpose of this study was to understand the various influences in the rapid development of industry and vocational education in Japan from the early Meiji period (1868) to 1980. The two areas were considered to be mutually supporting in their advance of Japan's industrial development in that Japan percieved herself as a poor, backward nation who must either develop her industrial strength or be dominated by the other industrial powers of that period. The Japanese have always had an aversion to importing foreigners for whatever reasons; hence the drive to train her own technicial personnel at the earliest possible stages.

This attitude was also in concordance with Japan's appreciation of her own resource base, that is, her almost total lack of natural resources. On the other hand the one resource base she did possess in abundance was the diligence and intelligence of her population.

The methods used in preparing this survey were a synthesis of library research, personal interviews to confirm library findings and direct observation of Japanese work practices both in Japan and through video taped and filmed reports.

Some of the findings of this survey reflect the little publicised "dual structure" of the Japanese industrial complex and the consequent "dual structuring" of the

work force which in turn created a "dual structured" vocational education system.

This "dual structure" has served Japan well in that the large companies have been able to afford to introduce the newest and most efficient materials handling and manufacturing techniques while the small companies, usually acting as subcontractors to the large one have served as agile, flexible manufacturers of components for large companies (such as Toyota, Nissan) with the ability to shift production and products quickly. As a secondary consideration the use of small suppliers acts as an effective quality and price competitive control, since the larger companies can easily shift purchases away from unsatisfactory suppliers. The small companies are thus at the mercy of the large companies, but are also necessary to the survival of the large companies.

A similar situation exists in the labor force. Amongst job applicants, the prospect of relatively secure life-time employment makes the large companies the premium choice for workers. The small companies, unable to offer anything like the security, fringe benefits and pay scales of the larger companies are very much a second choice.

The "dual structure" in turn heavily influences the education system in Japan. One of the influences felt in the Japanese industrial environment is the ideal of flexibility of the worker. The Japanese worker tends to iden-

tify himself much more strongly with the company he works for than with his skill or job description within the organization. If, say, a Japanese electrician is shifted to a welding job, he does not seem to object. Hence the company feels able to keep that worker employed rather than laying off an electrician and hiring a welder. Since the unions tend to be weak anyway, the companies have little difficulty in asking workers to cross job skills lines.

This in turn means that the company hires an individual for the sum of his personal assets rather than on a narrow skill-based criteria.

The effect of these hiring practices on the education system has been considerable, since the emphasis of educational programs has tended to be towards both skills development and personal development, in order to maximize the students' opportunites in the job market. For the above reasons, the government-run public vocational schools tend towards a generalist type of education so that if the student is successful in obtaining employment with a large company, he will be able to draw on an adequate personal and skills foundation to deal successfully with the specialist courses taught in industry-based schools. On the other hand, if the student is unsuccessful in becoming part of the large industrial work force (only 30 percent of the total are employed by these large

firms) he still has received a flexible enough education so that he may obtain employment with the smaller companies who employ 70 percent of the workforce.

The private company school courses are relatively narrow in scope, with the emphasis being on developing a high level of different skills in on-the-job training environments. This practice works well with the 30 percent of the work force who work for large companies on a permanent life-time employment basis. At the same time, these student-workers receive a reasonably comprehensive education in the non-skill areas due to the necessity of passing the government administered tests under the Skills Authentication Act of 1958.

Concurrently, the 70 percent of workers who work for small companies are also well served by the Skills Authentication Act since these workers are much more likely to move from one company to another, and therefore require this certification of their skills and education to carry them from one company to the next.

It is evident from the information gathered that the education system works closely with both industry and the government Ministry of Industry in determining the direction of vocational education, both as to short-term needs and for longer-term industrial strategy. From Kahn's comments on "throw-away industries" that are "not for Japanese" we may deduce that the vocational courses appli-

cable to those industries are being, or already have been, phased out in favor of those courses stressing expertise in future technologies such as high tech electronics or telecommunications, and computer manufacture, design and servicing.

Although Japan considers her people as her most valuable resource, it should be evident from the forgoing that the vocational education system still exists, not to serve the needs of the individual, but to serve the needs of the state.

Japan's ideal of developing human resources to serve modern industry were in response to a unique combination of forces and historial circumstances that culminated in a multiple track, segmented industrial training program which varied from industry to industry in the enterprise-run schools.

Since the original conditions have changed greatly in the areas of structural shifts, economic activity and steady modification of societal values, Japan will likely continue to make appropriate adaptations in her training and employment programs which reflect the new realities for flexibility and change within her economy. While these program changes may take time, it is unlikely the Japanese will be content to rely on the existing education programs. In any case, the increasingly high level of education in Japan combined with the ideal of "education

for personal advancement" has made the Japanese population aware of, and prepared for, the coming transitions.

While this study is primarily directed towards the Japanese experience, there is another group or culture in the Western world that has a similar approach to high-quality craftsmanship and a similar attitude towards education. This group is the Jewish community wherever its members are located.

The Jewish people have held the ideals of a closed, insular society, with long established and carefully maintained traditions for nearly five thousand years. At the same time, the ideals of personal development, higher educational achievement and pride of workmanship have been consistent facets of the Jewish culture. The similarity of the Jewish and Japanese experience would therefore argue for the transferability of Japanese training and management practices, rather than their being unique to Japan and not useable by any other cultures.

CONCLUSION

The Japanese vocational education experience, while unique in location and the historical venue, has in fact a number of pertinant lessons to teach Albertans. In the first place Japan, because of her history, percieved the necessity of taking some risky decisions in all aspects of her national advancement. These risks may well have been justified on the principle that big risks, while courting big failures, also promise large rewards. While the Emperor Meiji is credited with the reforms that jerked the Japanese nation from a backward, feudal society, foreward into modern nationhood, the Japanese were fortunate in producing an educational administrator of Arinari Mori's vision and stature who, in the face of enormous opposition, laid the foundation stones of the edifice that is modern Japan's education system.

Mori's victories were not total however, the most visible failure being the retention of the Chinese Kanji alphabet. This victory of the conservatives in the Meiji cabinet will cause increasing difficulties for Japan as they try to adapt this essentially outmoded language form to the age of the computer. (Imagine a keyboard containing upwards of 1,300 basic symbols!)

Furthermore, as noted by Hall, because of the amount of time spent on repetition and rote learning required to

master the Kanji alphabet, the creative aspects of the students and young workers tend to stifled.

At the same time however, it should be recognized that Japan was exceedingly fortunate in being able to draw on a large, dedicated and well educated segment of the population in order to implement her early education programs.

The willingness of subsequent generations of educators to sometimes take enormous risks in the overhaul and restructuring of educational programs was very creditable and commendable. At the same time, the closeness with which government and industry work in Japan meant that the then current and projected labour needs in industry led to the early introduction of what at that time were revolutionary changes in their education system.

The needs of the 1895 - 1935 period for trained technicians led to the growth of the multitrack system in which a number of private and public vocational programs functioned, not always with a uniform cohesive direction.

Japan is also an elitist, rather than an egalitarian society. This structure is not necessarily a handicap since it has fostered a paternalistic societal innovation known as Sempai-Kohai. Briefly, Sempai (the superiors in a system) act as power dispensers or as moral, financial or political supporters to their Kohai (inferiors). The Kohai reciprocate by supporting their Sempai in whatever

activity is deemed necessary. The system is at work in schools, factories, office, sports fields, politics and neighborhoods. It personifies the Japanese ideal of "the power of the group maximizing the power of the individual". In industry the Sempai-Kohai relationship is utilized in the factory work-teams that are a much publicised aspect of Japanese industry.

The enforced reforms under General MacArthur were not resisted to any degree because the Japanese themselves recognized the need for change and rationalization of their education system, although their reasons were not always the same as those of the Occupation Authorites. The "single track" system later evolved into the "double track" system of the polytechnical colleges and universities.

At the same time, a looming labor shortage in skilled labor in the late 1950's and early 1960's led to the rapid establishment of training programs for adults and handicapped persons on a massive scale (projected at over 1.5 million), designed to correct this short-term imbalance. (Levine and Kawada, 1980, p. 134) Although, Japan's ability to adapt and initiate new and innovative vocational education programs remains strong, she is running out of other models to study. Instead, the other countries are rushing to study Japan. Nonetheless, the overt partnership between education and industry will guarantee

a continuing innovative approach to training the personnel needed by the industries of the future.

In Alberta's case a closer study should be made of Japan's history in the field of vocational education. We have much to learn from studying both Japan's failures and successes in vocational education. In particular, we should at once try to identify those fields of effort in which Alberta possesses special expertise (oilfield technology for example) and in which we might develop a world-wide market. This will require some self-discipline on the part of our government in planning overseas trips for real experts rather than junketeering politicians.

Because of the uncertainty of the future, a real committment towards the ideal of producing generalists amongst our vocational students who are able to radically shift from job skill to job skill, preferably within an enterprise rather than narrow specialists. Some pressure should be put on industry to retain workers on a longer term basis in order to try to achieve some stability within the job market, as is reported in Levine and Kawada's work HUMAN RESOURCES IN JAPANESE INDUSTRIAL DEVELOPMENT.

The entire structure of Alberta's education system should be re-examined with a view towards a greater partnership between industry and vocational education in order to identify those skills required in modern

industry. A recent skills identification seminar conducted by the Northern Alberta Institute of Technology is a step in the right direction.

Both industry and vocational education should carefully examine three outstanding examples of the export of Japanese industrial relationships and personnel policies. These are the Honda plant in Marysville, Ohio; the Nissan plant in Smyrna, Tennessee; and the Sony Plant in San Diego, California. There is much to learn from these three apparently successful models. At the very least, these plants seem to be outstanding examples of the transferability of Japanese management and personnel handling techniques to a North American setting.

As reported in U.S. NEWS AND WORLD REPORT, July 4, 1983, one of the lessons from these three plants appears to be that flexible workers who are moved around within the plant mean greater job satisfaction and a consequent increase in the quality of work performed. Another lesson seems to be that the workers prefer job security within a company to union-enforced skills security with the attendant likelihood of frequent layoffs.

With a view to producing generalists within the vocational education system, the Ziel program should be reexamined with a view towards implementing the total program rather than the partial implementation now in use. There is too much of a commitment to teaching obsolete or

obsolescent skills within the vocational education system and this is a direct violation of the Ziel principles of producing generalists with a flexible outlook for the future rather than being locked into obsolescent speciality skills. (Woodworking and handcarving come to mind, as well as obsolete welding methods).

A commitment should be made to train or retrain unemployed or underemployed adults in Alberta to fill some of the high technology job openings now available, rather than relying on foreign trained immigrants. We are shortchanging our youth and our work force in Alberta by relying on foreign expertise to fill these positions with the consequent drain on the treasury for welfare, unemployment insurance payments and the possibility of social unrest amongst those who feel they have been left out of the mainstream of society.

Shimahara notes the impact of industry's needs on the re-establishment of the polytechnical schools in 1962. A noteworthy facet of the senmon gakko or polytechnics is the smooth, integrated progression of students from grade nine to two years post high school graduation. In these programs, the academic needs of the students are integrated with the technical programs in a mutually supporting structure which ensures that the technical school graduate will receive an adequate level of academic training for his future employment needs.

In Alberta, the link between high schools and technical or vocational schools is at best tenuous in that the technical schools have little control over the academic achievements of those students applying for admittance other than scholastic records and entrance tests. The technical schools in Alberta are unlikely to continue to be satisfied with this lack of control over academic performance, if recent conversations with career counsellors at the Northern Alberta Institute of Technology and the Southern Alberta Institute of Technology are any indication.

It therefore follows that while Alberta may well have "the best apprenticeship program in North America" as stated by Mr. G. W. Carter, former president of the Northern Alberta Institute of Technology at an Industrial Education Council conference in 1974, there is much room for improvement along the lines of the Japanese polytechnics. This would mean the installation of a two-track system in Alberta with 6 years primary, 3 years secondary and 5 years technical training for vocational students supplementing the present 6-3-3-4 or 6 years primary, 3 years secondary, 3 years senior high school and 4 years university for academic students. While some persons may criticise this proposal as "unequal" or "discriminatory", the system already exists in Alberta in the "streaming" of students into academic or vocational

programs within the high schools. Institutions of the 6-3-5 program would merely rationalize what already exists in Albertas' educational programs, while utilizing the Ziel program for the secondary and the academic high schools. The 6-3-5 program would in turn mean a comprehensive and consistent approach to vocational programs in Alberta by insuring a consistent level of academic and vocational training throughout the system from the grade 9 (or 15 year old student) level through to the post-secondary (or 20 years old student) level. The standards attained could then be raised as necessary or changed to reflect the existing or projected needs of industry as noted by Shimahara. In short, the polytechnical school appears to offer a more flexible and rational approach to the vocational needs of Alberta than the present system, with the Japanese model being an outstanding example of the excellence of the polytechnic institution.

## RECOMMENDATIONS FOR FURTHER STUDY

### FOR THE JAPANESE SCHOOL SYSTEM

Seriously re-evaluate the required teaching of the Kanji alphabet and writing system.

REASONS

1. The inordinate amount of time required by Japanaese (or any other) students to master the Kanji

writing system as compared to the Japanese Kata Kana and Hiragana phonetic alphabets or writing the English language, as noted in Halls' study and recommended by Mori.

2. The difficulties and complexities involved in applying the Kanji characters (over 1,300 in general use) to small computer keyboards and the attendant unwarranted costs created by the use of this system.

3. The general obsolescence of the Kanji in a modern or future industrial and commercial state.

4. The fact that, since the Kanji is an imported writing system (from China), it is not at all an essential part of the Japanese psyche or national identity.

5. The increasing complexity of life in a modern national setting means that the student must absorb ever more information in order to be able to make adequate judgements for himself in today's world. Since Japanese students now spend 240 days per year in school, as compared to 200 in Canada and 180 days per year in the United States, the choice appears to be either to extend the school year or to delete Kanji from the required courses, substitute Kata Kana and Hiragana, and offer the Kanji as an optional Classics study to those who wish to master it. Significantly, even the originators of the Kanji (the Chinese) are experiencing similar difficulties and have been reevaluating the teaching of the Kanji writing system in China.

6. The teaching of Kanji requires very large amount of rote or repetition practice, with more or less constant reinforcment. This emphasis on rote learning tends to stifle creativity.

NOTE: All of the above factors have been recognized by many Japanese educators as far back to and including Arinari Mori.

FOR ALBERTA

1. Restructure the regular and vocational courses to produce flexible and productive individuals, well able to take advantage of new employment opportunites in the future.

2. Try out the Ziel program in its entirety in an updated version with the objective of producing graduates of the type noted in number one.

3. Work towards a change in attitude favouring vocational education. The current practice of "dumping" underachieving students into the vocational programs should be discouraged at once. Vocational education is too important to the nation to rely only on lower grade talent for the necessary personnel. The pressure for excellence in the schools must be increased in order to encourage the graduation of highly talented entrants to the workforce. The introduction of entrance exams for vocational programs would be a big help in this direction.

4. Some means of uniform verification of scholastic and/or vocational skills should be adopted as soon as possible. Perhaps the Japanese Verification of Skills Act could serve as a model. The "Red Seal" program in partial use today is a good start in this direction.

Another example of this suggestion is the "State Board Examination" used by the nursing profession. The results achieved by nurses writing this examination are recognized throughout North America. Some varient of this program would be a considerable foreward step for vocational education since the qualifications achieved by a graduate would have near-universal recognition in North America.

5. Undertake an intensive study of Japanese industrial strategy, its relationship to vocational education and the targeting of promising future fields of industrial expansion.

This would in turn, require the involvement of industry in vocational planning and program development. The recent Competency Analysis Profile study undertaken by the Northern Alberta Institute of Technology in cooperation with industry in the fields of Civil Engineering Technology and Electronics is a step in the right direction.

6. Once promising future technologies suited to Alberta or where Alberta possesses a technological

advantage have been identified (oilfield technology and servicing are one example) or in some of the oilfield computer or electronics areas, an active training program should be undertaken with particular emphasis on the unemployed, underemployed or handicapped members of the work force. The choice appears to be one of either spending money and effort on retraining large numbers of adults in the work force or seeing them perpetually condemned to the unemployment and welfare roles with all of the social and financial costs that these imply. The Japanese attitude that "it is better to retrain our own unemployed than to rely on foreign expertise" may well be the correct attitude for Alberta in the 1980's.

7. A corresponding evaluation of industries should be undertaken with a view towards identifying those that are obsolete or are tending towards obsolescence. Disincentives of a financial nature should be used to encourage the phasing out of these enterprises. On no account should vocational education undertake training of students in the obsolete skills used by obsolete industries. Herman Kahn notes this tactic and its' success in Japan. The example should be followed if our industrial structure is to survive.

8. Industry should be encouraged to make long-term committments towards the retention of skilled workers coupled with internal retraining programs to redirect

those employees displaced by technological innovations or economic changes.

9. Due to the increasingly high reliance on robotics and the consequent obsolescence of many of the trades and skills disciplines, the journeymen's and apprenticeship programs should be critically reexamined and overhauled with a view towards breaking down the rigid barriers to crossing trades lines and increasing the mobility of the individual in seeking and finding employment. It must be clearly understood that the trades structure was originally developed to serve the individual workers rather than the other way around. The strike-prone foreign and domestic industrial system could serve as outstandinginly bad examples of the above comments.

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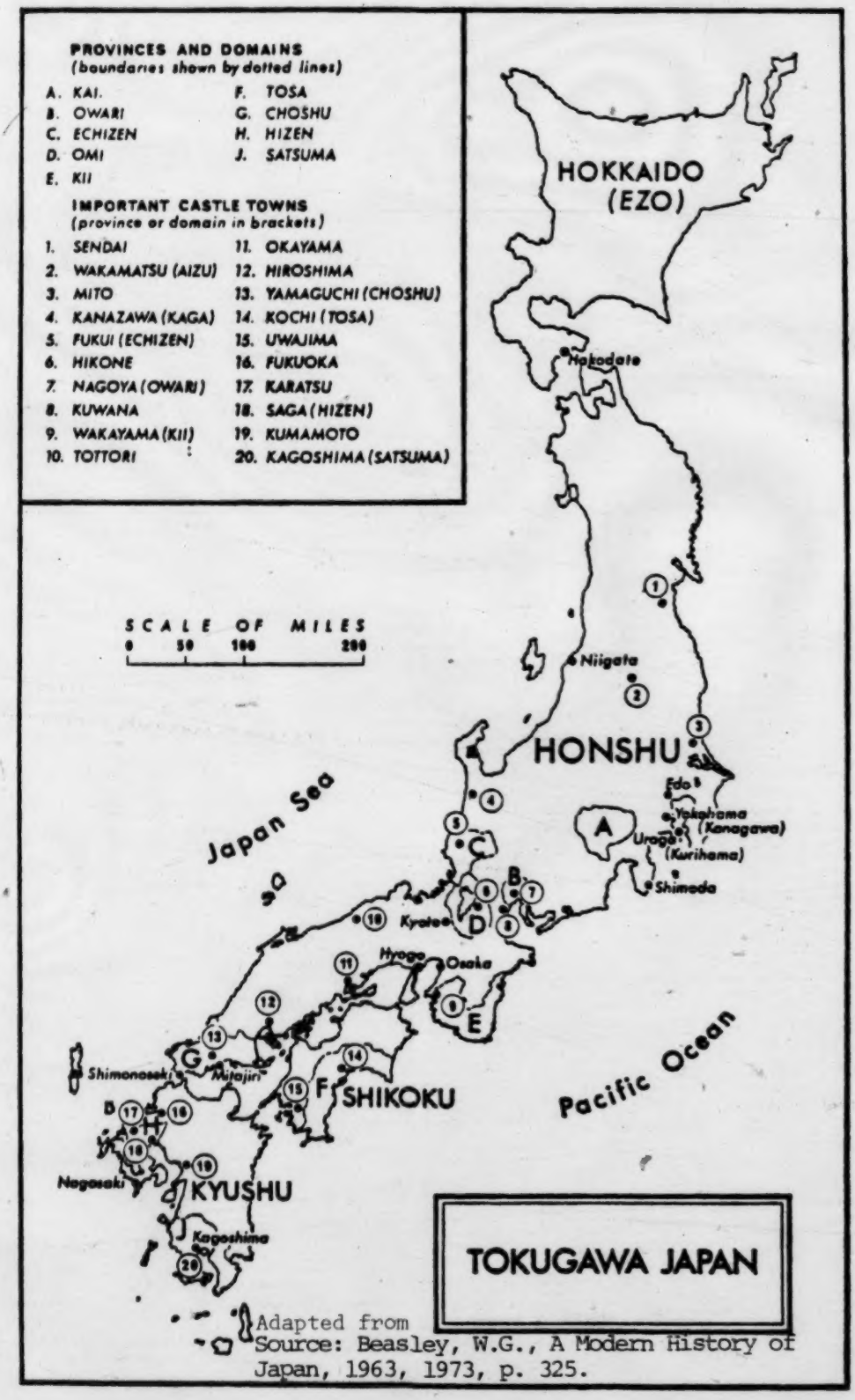
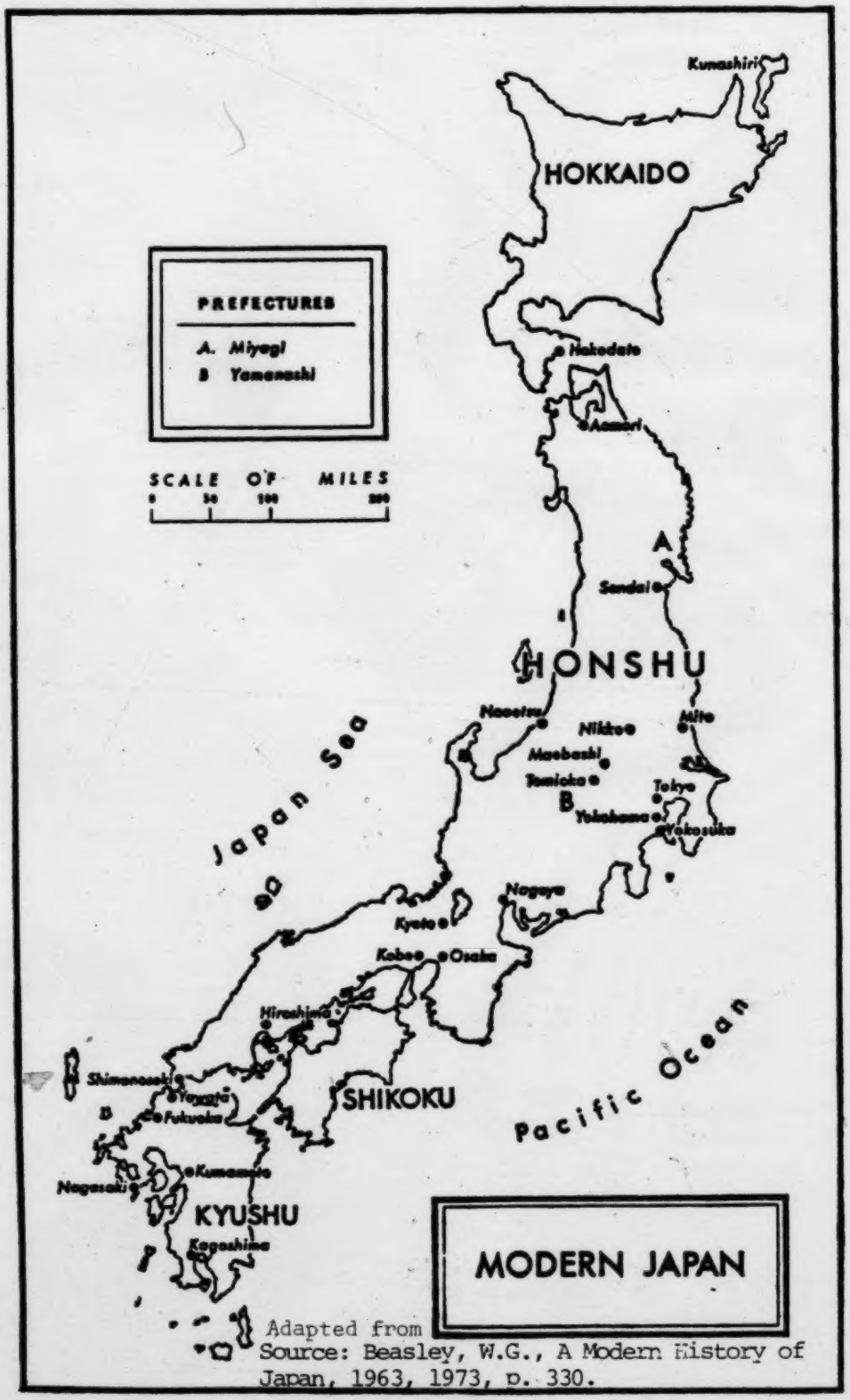
APPENDIX I(A)




Adapted from
Source: Beasley, W.G., A Modern History of Japan, 1963, 1973, p. 325.

APPENDIX I(B)




Adapted from
Source: Beasley, W.G., A Modern History of Japan, 1963, 1973, p. 330.

## APPENDIX II

### 1889 RESCRIPT

KNOW YE, OUR SUBJECTS:

Our Imperial Ancestors have founded Our Empire on a basis broad and everlasting and have deeply and firmly implanted virtue; Our subjects ever united in loyalty and filial piety have from generation to generation illustrated the beauty therof. This is the glory of the fundamental character of Our Empire, and herin also lies the source of Our education. Ye, Our subjects, be filial to your parents, affectionate to your brothers and sisters; as husbands and wives be harmonious, as friends true; bear yourselves in modesty and moderation; extend your benevolence to all; pursue learning and cultivate arts, and thereby develop intellectual faculties and perfect moral powers; futhermore advance public good and promote common interests; always respect the Constitution and observe the laws; should emergency arise, offer yourselves courageously to the State; and thus guard and maintain the prosperity of Our Imperial Throne coeval with heaven and earth. So shall ye not only be Our good and faithful subjects, but render illustrious the best traditions of your forefathers. The Way here set forth is indeed the teaching bequeathed by Our Imperial Ancestors, to be observed alike by Their Descendants and the subjects, infallible for all ages and true in all places. It is Our wish to lay it to heart in all reverence, in common with you, Our subjects, that we may all thus attain to the same virtue.

## APPENDIX III

An Example of Subject and Credit Combination for Pupils in an Industrial Course (Machine Shop)

(1) Main Table

| Areas | Subjects | Number of Credits (1st-3rd years) |
|---|---|---|
| Japanese Language | Modern Japanese | 7 |
| | Classics IA | 2 |
| Social Studies | Ethics-Civics | 2 |
| | Political Science Economics | 2 |
| | Japanese History or World History | 3 |
| | Geography A or Geography B | 3 |
| Mathematics | Basic Mathematics or Mathematics I | 6 |
| | Applied Mathematics | 3 |
| Science | Basic Science or one of the following: PhysicsI, Chemistry I, Biology I and Earth Science | 6 |
| Health & Physical Education | Physical Training | 7 |
| | Health | 2 |
| Fine Arts | Music I or Fine Arts I or Handicrafts I or Calligraphy I | 2 |
| Foreign Language | Elementary English or English A | 6 |
| Total of General Subjects | | 51 |
| Vocational Education | Industrial Subjects (See Table 2) | 43-48 |
| Homeroom and Club Activities | | 6 |
| TOTAL | | 100-105 |

(2) Combination of Industrial Subjects

| Subjects | Number of Credits (1st-3rd years) |
|---|---|
| Machine-shop Practice | 14 |
| Mechanical Drawing | 9 |
| Machine Design | 7 |
| Machine-shop Theory | 6 |
| Prime Mover | 3 |
| Industrial Measurement Automatic Control | 2 |
| Materials for Machine Works or Industrial Management or General Electricity or Industrial English | 2-7 |
| TOTAL | 43-48 |

## APPENDIX IV

SUMMARIZED ANSWERS TO QUESTIONS POSED TO INTERVIEWEES

Q Are technical schools or colleges solely government run or are there private technical colleges similar to the private high schools?

A There are no national schools, most are privately run at prefectural levels.

Q Are there vocational schools such as N.A.I.T. or S.A.I.T., offering a wide variety of courses, or are the courses and schools very specialized?

A Technical schools tend to be extensions of the public school system, with heavy emphasis on academic and general courses, specialized courses taking 45 - 50 per cent of the time alotted. (See examples of course outlines)

Q Are industry-run schools teaching only the subjects needed for specific job required by industry or are a wide variety of courses taught?

A Wide variety with emphasis on mobility within company but life-long security within company.

Q What books are available on the above subjects?

A NIL (Subsequent discovery of Levine & Kawada, 1981)

Q Names of schools and their locations, types of courses they specialize in?

A Depends on local industry - normally serve local industry therefore location and subjects taught are specific to local industry.

Q Are the courses specific to the area in which they are taught or universal throughout Japan?

A Depends on subjects, ie: local industries such as fishing or country-wide applications such as machine-tools or welding.

Q Are there any apprenticeship programs?

A Yes, but relatively weak trade unions and journeyman structure. Emphasis on generalized courses and work environment. Preference for adaptability among workers to facilitate retraining workers into new jobs.

Q Is there an upper age limit for recruitment into larger industries?

A Twenty five years of age. Beyond 25, the companies are reluctant to engage new employees because of pension considerations and because the employee is considered to have become more rigid in his outlook on life. Under 25, the employee is considered to be more flexible and therefore more adaptable to the enterprise.